

# POPULAR <sup>Lo Rock</sup> Only 40p. Computing WEEKLY

11 - 17 April 1985

*It's the best selling weekly*

Vol 4 No 15



MICROS IN MOVIES  
FEATURE ISSUE

## Software houses go for Amstrad's 664

SOFTWARE houses are already planning software support for the new Amstrad 664 disc-based micro, due to be launched next week.

Virgin is planning an enlarged and enhanced version of its acclaimed program *Sorcery* on disc as soon as possible.

"Once we've got some machines to work on, we'll start," said Nick Alexander of Virgin. "*Sorcery* on disc could obviously be much bigger, with more rooms, and we'd like to enhance the

graphics as well."

Micromega and Micro-power are also planning disc games for the new machine after its launch this month and Level 9 intends to convert its Amstrad adventure range at around £15 per disc.

The Amstrad 664's specification, with the built-in disc drive and CP/M and Digital Research's Logo bundled with it, will make it the first in its field at a home market price. Versions will be available bundled with either a

continued on page 5 ▶

## Atari trims XEs

WITH Atari poised to launch its new ST and XE micro ranges at the Hannover Fair next week, it is still not clear which machines will eventually appear.

It seems likely that Atari may now shelve its range of 64K 8-bit micros altogether.

The priority models are the 128K 130XE 8-bit and the ST 16-bit machines which will become available here and in Europe at almost the same time as in the US - in May.

"We have brought the 130XE forward," said Atari UK's managing director Simon Westbrook. There will be a few machines available in the UK immediately around that time to distribute, though thinly at first."

Launch schedules for the

other 8-bit XE models are, however, far from clear.

Originally Atari announced it would produce four XE models: 130XE (128K) 65XE (64K), 65XEM (music version

of 65XE) and 65XEP (portable version of the 65XE).

The 65XEP portable has already been shelved (see *Popular Computing Weekly*, March 28th).

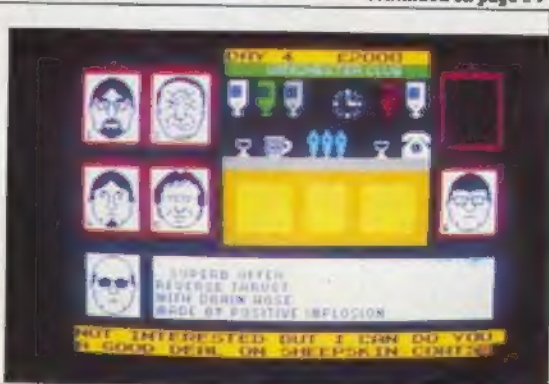
Now the 65XEM 'music machine', an XE with a MIDI interface will not be at Hannover, and there is some doubt that it will ever appear. "It is

continued on page 11 ▶

THE THAMES Television and DK'Tronics game *Minder*, based on the perennially popular TV series will be available by the end of the month.

The program, currently for the Spectrum costs £9.95, and it will be followed by versions for the Amstrad, MSX, Memotech and Commodore 64.

Micros in the Movies: *Minder* is reviewed on p14 and its creator is profiled on p39.



INSIDE ▶ GAMES TURN INTO INTERACTIVE MOVIES - SEE PAGE 20 ▶



# MOON CRESTA

OFFICIAL LICENCE  
FROM NICHIBUTSU

## TRIP TO THE SPACE WAR!

THE CLASSIC MOON CRESTA MANUFACTURED  
UNDER EXCLUSIVE LICENCE

COMMODORE 64 £6.95  
SPECTRUM/SPECTRUM + £8.95

TRADE AND CREDIT CARD ORDERS  
TELEPHONE (0734) 591678

INCENTIVE

54 London Street, Reading RG14SQ



**C**uriously, both the Amstrad 664 and Atari ST are to be officially launched next week, almost on the same day.

Amstrad's machine is a natural development from its successful CPC 464 micro. It has a beefed-up Basic and a built-in disc drive, uses the same 8-bit chip and is 464 software compatible.

Atari on the other hand has chosen a more radical approach - a 32/16-bit micro with all the trappings of up-market machines from fashionable companies like Apple - mice, windows and icons.

Despite the fact that the Atari is a more expensive system than the Amstrad - by the time you've bought a disc drive and monitor it'll cost over £700 - its low entry price of £399 ensures that two machines will compete directly.

The advantage of the Amstrad system is that with CP/M it immediately has access to a huge library of albeit rather outdated software. It uses established technology, and it is likely to be in the British shops in volume well before the Atari. Disadvantages may be the high price for disc software (although Amstrad is hedging its bets by including a cassette interface, Sinclair take note) and a potential conflict with the existing 464.

The Atari ST is an altogether braver - and riskier - offering. The danger is that it will suffer the kind of software and hardware snags that have dogged the QL.

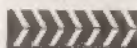
Of the two machines, the Atari ST, despite its uncertainties, must be the winner, though. Micro computing is above all a hobby and one in which the new-fangled sports model will always be more attractive than the dependable saloon.

# POPULAR Computing WEEKLY

Vol 4 No 16

## Presents...

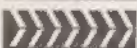
News > Sinclair leads in new survey



**Micros in the Movies** > From C3PO to K9, Martin Croft takes a sideways look at micro movie-stars



**Micros in the Movies** > Did the game really live up to the film? We take a look at some famous spin-offs



**Micros in the Movies** > ■ it all done with mirrors? We visit the Moving Picture Company to see how micros are used in film and TV production

**Micros in the Movies** > Graham Taylor traces the development of the 'computer movie'

**Star Game** > An unusual strategy game for Spectrum owners - by Robin Drayton

**The QL Page** > Return of the Call Bug - a new solution by Dr R K Lowry

**BBC and Electron** > Part Two of the Tracer project for the BBC B by Calvin Woodings

**Amstrad** > An invaluable monitor for the CPC 464 written by Brian Cadge

**Streetlife** > Graham Taylor trucks down the apples and pears, leaves it out, knocks it on the head and finds Minder programmer Don Priestley to be a real gent

**Best of the Rest** > Commodore 64 > Arcade Avenue 36 > Top 10, Diary 46 > Readers Chart 46 > New Releases 47 > This Week 47 > Puzzle, Ziggurat, Hackers 50

## Futures . . .

Dissect your Basic listing on the Spectrum . . . Andy Pennell on the new JS QL Rom . . . The Tracer project continues on the BBC B

Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Group advertisement manager David Lake Advertisement manager Alastair Macintosh Assistant advertisement manager Tom Watson Advertisement Executive Diane Holyoak Classified executive Diane Davis Advertising production Ludinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 236275 Typeset by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. Printed by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. Distributed by S M Distribution, London SW9. Tel 01-274 8611. Telex 261643 © Sunshine Publications Ltd 1985.

ABC

56,052 copies sold every week  
(Jan-June 1984 ABC)

**How to submit articles** Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here - so please do not be tempted. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year





## REWRITE THE HIGH SCORE TABLES

With the Gunshot, you'll have all your enemies cowering in corners. 8-directional action and an all-in-one moulded stem allows accurate annihilation and strength to survive those all-night sessions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12 month guarantee will prove invaluable. The Gunshot plugs directly in to practically all popular home computers (ask about Vulcan interfaces for the BBC, Spectrum, Electron, C16, Plus 4). Only £8.95.

See the range of Vulcan joysticks and interfaces at your local stockist ... we'll see you on the high score tables.



**VULCAN**  
ELECTRONICS LTD  
*Joystick Genius*

200 BRENT STREET HENDON NW4 1BH TEL: 01-293 6366



## Sinclair heads UK in new survey

A NEW survey of the home micro market confirms Sinclair as the market leader in the UK.

The study, by AGB Cable and Viewdata, gives Sinclair a market share of 38% between October and December 1984. This is down however from 45% a year earlier.

Commodore, the survey claims, has a share of 21%, while Amstrad's CPC 464 has captured 8%. Acorn's share has increased from 8% in the last three months of 1983, to 22% a year later.

AGB Cable and Viewdata's

study also claims that the market continued to grow very fast in 1984, but looks like slowing considerably this year.

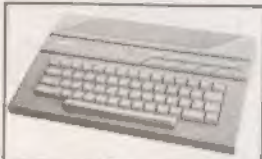
Out of all homes with computers, 43% bought their micros over the last twelve months, one in five during the Christmas period. But only 7% of non-computer owning households expressed a strong interest in buying one.

More than 55% of those questioned said they felt the computer's main application was for playing games.

## Atari trims its XE series

◀ continued from page 1

possible there is no music micro to come out at all," Simon continued. "It's a case



Atari's 65XE

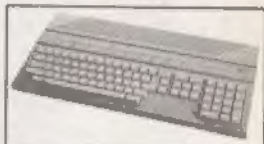
of Atari reserving the right to upgrade and adjust products, if you like, and the ST has a MIDI interface anyway."

Atari claims to be planning a 16-bit portable to fill the gap left by the 65XE. "While the idea of an 8-bit portable seemed excellent in January, the 16-bit looks a better bet now. With chip prices tum-

bling and needs becoming more sophisticated we reckon 130K and 16-bit will become the norm, and we don't need to be messing around with 64K in music machines and portables," said Simon.

"At CES, in January, however, the difference in cost between a 64K and 130K was far more substantial."

In the US, Atari is hoping to see both the XE and ST series



The 130ST - top priority

in the shops by the end of this month. While the XE could beat that over here, albeit in restricted numbers, the ST models are not expected until May or June.

## To Russia with love

REPRESENTATIVES from Sinclair and Memotech have both revisited Russia to hold further talks on the sale of micros into Russian schools (see *Popular Computing Weekly*, February 14).

Acorn, Sinclair and Memotech all made a good impression on the Russians when they exhibited at Technobuch, a Moscow micro show, at the end of January.

Sinclair is believed to have

teamed up with ICL who will be going to Russia to negotiate on its behalf this month.

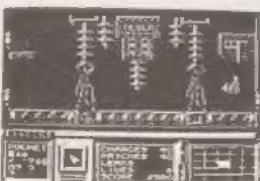
The Memotech consortium, which includes representatives from the company's distributors, Spectrum Group, also made a ten-day visit last month, and succeeded in selling £20,000 worth of Memotech MTX 812 machines to the State Committee for Professional and Technical Education.

The Russian education market is potentially huge - the Soviets eventually plan to equip between 60,000 and 70,000 educational establishments with around 20 micros each.

## Strangeloop hits C64

VIRGIN has now converted its Spectrum game *Strangeloop* for the Commodore 64.

The conversion features



some new puzzles to solve, and ten more rooms than its predecessor.

Priced at £7.95, *Strangeloop* for the Commodore 64 should be available by mid-April.

## C5 production halted

PRODUCTION of the Sinclair C5 was halted briefly last week to allow a faulty part to be replaced.

Between two and three thousand vehicles were affected by the problem, which involved a plastic moulding

on the gear box which was apparently not up to standard.

Sinclair Vehicles stressed that the C5s involved had never left the factory at Merthyr Tydfyl, and that there was no question of any others being recalled.

Up until the third week of February an estimated 5,000 C5s had been sold. No figures are available for sales since the 'electrically powered tricycle' moved from mail-order to retail sale.



## 'Hackers' appear in court

ROBERT SCHIFFREEN and Stephen Gold, the two men arrested on computer disc forgery charges a fortnight ago (see *Popular Computing Weekly*, April 4), appeared at Bow Street Magistrates Court on April 3rd.

Both were remanded on unconditional bail until a hearing on June 12th.

## Companies go for 664

◀ continued from page 1

monochrome or colour monitor which are expected to sell in the £350 to £500 price band.

The 664 and 464 (the existing model with built-in cassette recorder) will be upwardly compatible only. Improvements to Locomotive's Basic apparently mean that 664 programs will not necessarily run on a 464, although the basic code remains the same.

Amstrad will be pushing disc software for the 664 - likely to be priced around the £25 mark (see *Popular Computing Weekly*, April 4) especially with its 'up-grade' from tape to disc scheme. An optional cassette recorder will almost certainly be offered for the 664, though. The machine has a din socket cassette interface at the back that would take a cassette recorder lead.



# BEYOND

CHALLENGING SOFTWARE



The secret will soon  
be out:  
Spy vs Spy is  
going Spectrum!



# Quite simply, be a better Spectrum user.

Here are ten great books that should be on the shelves of every serious Spectrum user.

You'll find a collection of programs for graphics, games, business, sound and intelligence. You'll find tips for beginners, and machine code for boffins. You'll find you can really get the most from your Spectrum – simply and straightforwardly.

Order your Spectrum books from Sunshine now.

See them in your local bookshop, or use the coupon below.



## Sunshine books Direct Order Form

### Sinclair ZX Spectrum books

The Working Spectrum	£5.95
Spectrum Adventures	£5.95
Master Your ZX Microdrive	£6.95
Machine Code Applications	£6.95
ZX Spectrum Astronomy	£6.95
Artificial Intelligence	£6.95
Spectrum Music	£6.95
Building with Logo	£6.95
Inside Your Spectrum	£6.95
Machine Code Sprites & Sound	£6.95

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops.

Dealer enquiries: 01-437 4343

Send to: Sunshine Books  
12/13 Little Newport Street  
London WC2R 3LD

Please send me the following books:

Book \_\_\_\_\_  
Book \_\_\_\_\_  
Book \_\_\_\_\_

- ☐ I enclose a cheque for £\_\_\_\_\_ payable to Sunshine Books.  
☐ I enclose a postal order for £\_\_\_\_\_ payable to Sunshine Books.  
☐ Please charge my Visa/Access card No. \_\_\_\_\_, valid from \_\_\_\_\_ expires end \_\_\_\_\_

Signed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_



# HISOFT ULTRAKIT £9.45

The most powerful toolkit yet for ZX BASIC. All the features you will ever need: AUTO insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping. Full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

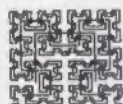
# DEVPAK £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

# PASCAL £25

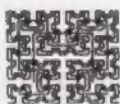
A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. "I haven't seen any other compiler that could match Hisoft's Pascal"

All prices, UK delivered, relate to 48K ZX Spectrum versions.



**HISOFT**

180 High Street North  
Dunstable, Beds. LU6 1AT  
Tel: (0582) 696421



# HISOFT presents

## FONT 464 for the AMSTRAD CPC 464

FONT 464 is a font designer and character generator especially developed for the CPC 464 microcomputer.

Design your own character fonts and graphic symbols with this very friendly and powerful package.

FONT 464 allows you to create a new design or amend an existing one using set, reset, invert, reflect, rotate, inverse and even animation!

Load and save character sets to/from tape, use the new character(s) from BASIC, design your own animated graphics - all this and more with FONT 464.

FONT 464 is supplied with three interesting and amusing character sets for you to experiment with.

★ All this power for: £7.95 inclusive ★

We also have available for the Amstrad CPC 464:

Hisoft Devpac - our full Z80 assembler and disassembler/debugger with more features than you'll ever need.

Hisoft Pascal - a virtually full implementation of Standard Pascal. Compiles and executes incredibly quickly.

Please write to Hisoft for more details of Pascal and Devpac on the CPC 464 or contact Amsoft with your order.

## Get some unbiased advice about cassette duplication

"We have traditionally been a quality software house. DataClone have traditionally been a quality duplicator - we have used them for the last three years with complete satisfaction." MICROPOWER.

"We produced over 1/2 million units with them in 1984 and we're still good friends."

DORLING KINDERSLEY.

"Competitive pricing, fast turnaround and a very reliable product - what more could we ask for."

BEAU JOLLY.

"DataClone have produced high quality, trouble free products and an excellent service all round.

We would recommend them to any company producing software."

BOURNE EDUCATIONAL SOFTWARE.

"Our orders before Christmas exceeded our expectations. DataClone cured the production problem with time to spare!" TANSOFT.

Other services include printing, packaging, packaging design and disc duplication. Agents for Novaload and Powerload Fast Systems for the Commodore 64 and Spectrum 48K machines.



**DATACLONE**

Unit 1, Roslin Square, Roslin Road, London W3 8DH.  
Telephone: 01-993 2134. Telex: 21879.



# MIRRORSOFT

**“The entire product is “first rate”.”**

—*Commodore Horizons*

**“It really brings a storybook to life**

**... A program like this is a must.”**

—*Educational Computing*

**“This is a beautiful program well thought out, educational, and entertaining.”**

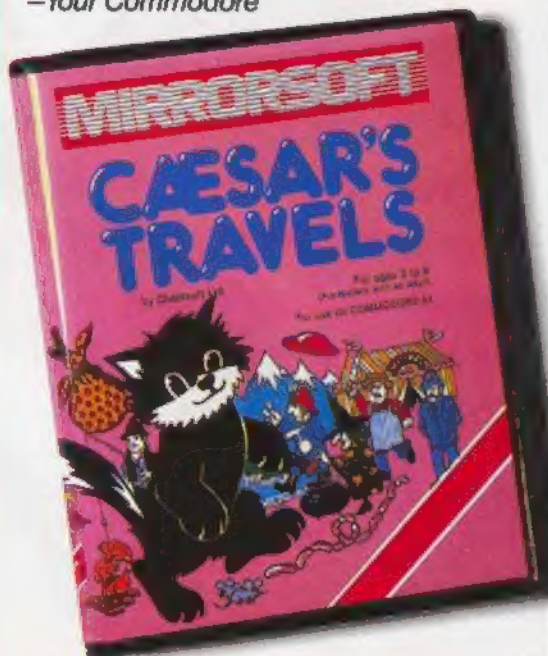
—*Home Computer Weekly*

**“I think if you have children under ten, they should be transfixed by this one and I might add that I was too.”**

—*Popular Computing Weekly*

**“A well thought out package which my four year old loved to play and which will give hours of amusement.”**

—*Your Commodore*



**“Caesar’s Travels has a quality which makes most “grown-up” adventures look like the half-baked bilge they actually are!”**

—*Your 64*

## BEDTIME STORIES WILL NEVER BE THE SAME!

**CAESAR’S TRAVELS** is a unique combination of interactive story book and animated computer program. You decide what Caesar does next in his search for a new home. In all, there are 38 different stories, with 18 different endings so it will be a long time before the kids get bored with this one!

Available for: Cassette £7.95

CBM 64, Spectrum 48K,  
Amstrad CPC64

Disk £10.95

CBM 64, Spectrum 48K

**Aims:** To encourage newly-acquired reading skills plus a few simple tests

**Age range:** 3-9 years (pre-readers with an adult)

**MIRRORSOFT programs are available from good software stockists everywhere or by mail order from: MIRRORSOFT Mirror Group Newspapers Ltd., Holborn Circus, London EC1P 1DQ Telephone: 01-822 3580**



Cute.  
Clever.  
Mischievous.  
Intelligent.  
Dangerous.



# GREMLINS



**Gremlins the Adventure,  
available early April on  
Spectrum, Commodore 64, C16,  
BBC and Electron.**



Dealers contact: Nigel Banford, Adventure International  
85 New Summer Street, Birmingham.  
**Telephone: 021-359 0801**

© WARNER BROS INC 1983





## Silicon celebrities

**Martin Croft looks at the chequered career of computers in the movies**

**A**nother year, another Oscar ceremony - and another slight to a minority group.

Not one award went to a robot or an artificial intelligence, even though some of the year's best performances were by non-organic entities.

It's hardly surprising, though - computers have been treated shabbily since films began, and robots haven't fared much better.

Back in the 1920's, Fritz Lang's *Metropolis* involved a femme fatale leading men to evil ways. A lot later on, *Demon Seed* had a ludicrous plot revolving around a computer's lust for Julie Christie.

*Electric Dreams* had a micro falling in love after having champagne spilled on its keyboard, and *Saturn 5* had Farrah Fawcett Majors being attacked by a robot.

If robots aren't ripping puny humans limb from limb or in lustful pursuit of helpless women, then at the other extreme they're bowing and scraping to their human masters alongside Uncle Tom.

Look ■ Robby the Robot in *Forbidden Planet* (at least he was allowed to keep some dignity on the silver screen - on TV's *Lost in Space* he was an absolute dummy). Or even C3PO and R2D2 - or the cute little robots in *Buck Rogers* or *The Black Hole*.

About the only robot with a decent role in cinema history was Klaatu in *The Day the Earth Stood Still* (which ■ what he did for most ■ the movie). Strong, silent, a robot of few words - none, in fact.

Androids, robots in the guise of humans, get slightly better roles, which is obviously blatant bias towards their human appearance.

Of course, it could be because the directors can use a human for most of the sequences involving androids. Some of the better human stand-ins include Rutger Hauer in *Blade Runner*, and Arnold Schwarzenegger in *Terminator*.

But although androids tend to get stronger roles, they are usually evil through and through. The android in *Alien* is a case in point - not only vicious and sadistic, but prone to assaulting women with rolled up newspapers.

If robots are mostly sex maniacs, computers are incipient megalomaniacs, always striving to take over the world. In *The Forbin Project*, a Russian and an American super-computer get together and start issuing orders to all and sundry. In *WarGames* a computer starts playing games with real nuclear missiles.

Of course, the best known example of

a computer losing its mind is in 2001.

HAL murders four out of the five human crew members on the spaceship *Discovery*, apparently in a fit of pique at not being given command of the mission.

Bowman, the lone survivor, cripples HAL by destroying his memory.

*Dark Star* has an intelligent bomb which is fooled by humans using Cartesian logic - but it has the last laugh.

Quite why computers should wish to rule the world is never fully explained in any of the movies which feature power hungry mainframes, maybe it's just a cry for attention.

Compared to the treatment dished out to artificial intelligences by Hollywood, television is remarkably pro computers.

Batman and Robin couldn't have fought the rather bizarre crime waves which affected Gotham City without the stalwart support of the Batcomputer. This wonder of 60s technology shot out its answers neatly typed onto a piece of biscuit shaped card.

Dr Who, of course, had the aid of his pet computer K9, who seemed capable ■ just about anything so long as he was kept away from lamp-posts.

Of course, Dr Who did feature the Daleks, the Cybermen, the Yetis and the Shop Window Dummy Men, all villains of very large magnitude.

But then, the Daleks and the Cybermen weren't computers or robots, but cyborgs, unholy marriages of flesh and circuitry. The Yetis did appear to be robots, but were controlled by silver footballs - what was in the silver footballs no-one ever found out.

As for the Shop Window Dummies, if you has to stand around all day with

idiotic people gazing at you like fish in a bowl, wouldn't you feel like folding back your fingers and blowing them away?

Blake's 7 features two computers, one of which was actually the seventh member of the band of heroes fighting injustice - Zen, the Buddhist mainframe given ■ oracular utterances in perfect BBC English.

Orac, on the other hand, could have done not only with elocution lessons but with tuition in etiquette - quite the rudest computer on the small screen, which was pretty stupid considering he had to be carried around all the time.

But Blake's motley crew couldn't have survived without his grudging aid, so he has to be numbered among the good guys.

Marvin the paranoid android was also on the side of truth, justice, and the English way, however often he may have hummed Pink Floyd.

Douglas Adams' view of computers may endow them with far too many human qualities - acute melancholia, maddening politeness, and the inability to answer simple mathematical questions to name but a few - but generally speaking, *The Hitch-Hiker's Guide to the Galaxy* treated robots and computers just the same as humans.

On the other side of the Atlantic, Kit, the computerised car in *Knight Rider*, had to play second banana to a hair-dresser's dream, but at least he got some good lines and looked pretty.

*Automan* had ■ the charm and intelligence of an American college quarter back, so the less said about him the better. On balance, Robby the Robot was more of a sex symbol.

While television seems to treat robots and computers with tact and consideration, Hollywood has a long way to go.

Considering the part computers play in the making ■ movies today, film producers should be very careful - after all, their computers might take industrial action.



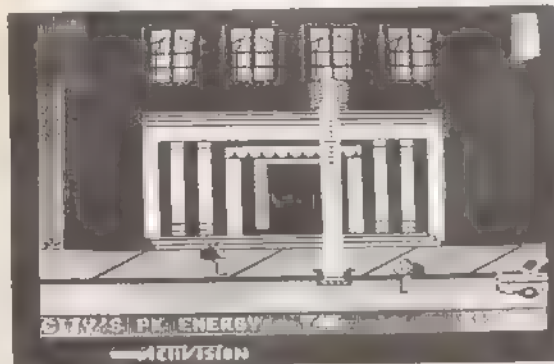


# Computers in the movies

## Foot-tapping

If there's something strange, (dum-dum-dum), in the neighbourhood, (dum-dum-dum-dum), who ya gonna

limited funds, and set off around the map of the city to (in true pursuit of the American Dream) recoup your initial investment by capturing ghosts as quickly and efficiently as possible. Succeed-



call? Shaw Taylor! Ray Parker Jr has a lot of answer for one way and another... in fact *Ghostbusters* the game probably owes more to the 12-inch remix than to *Ghostbusters* the movie, which in turn explains why the Spectrum version went straight out of the window in five minutes flat!

For the three people that didn't see *Ghostbusters* (the movie) over Christmas, the plot involved the wacky exploits of a team of paranormal hit-men, who capture spooks, and, eventually, save the world and civilisation as we know it.

Although the game lacks the Dan Aykroyd script, and the Bill Murray performance the Commodore version captures the spirit of the movie better than any spin-off to date.

At first, you equip your Ghostbusting business with

ing in this task, you go on to face the Ultimate Nasty in the Temple of Zuul.

Very good animation and fantastic music make this one



a foot-tapping must for any Commodore owner. . .

**Program** *Ghostbusters* **Price** £10.99, £9.99, £10.99, £11.99, £4.99 resp. **Micro** CBM 64, Spectrum, MSX, Amstrad, **Atari Supplier** Activision, **Harley House** Marylebone Road, London NW1 SHE

and stands forlornly on the stage that forms the central screen of the game.

To de-stone your other half you must collect the various parts of the de Medusa which releases the deadly spell. There is a time limit which slips away on a clock at the bottom of the screen. The various bits you need are scattered over the 14 different screens of a gothic mansion. There are, needless to say, baddies and these too are characters from the film.

Riff Raff wanders about, blasting you wherever he finds you. More provocative still (this is what the kids want)

## Superficial

There's not much doubting the heritage of this game; the link with the originator of *Give My Regards to Broad Street* is made obvious by near continuous backing music that turns out to be *Band on the Run* - the old Wings classic.

On the Commodore version it's fine, the Spectrum version is odious.

The game's links with the film are extended further with the packaging - a large poster includes a fact sheet outlining the game, a London tube map, a detailed plan of London roads (well, it won't replace the A to Z but it's OK) and a description of the characters in the game. The descriptions prove to be a fundamental element in the game, since you must use this information to guess where the characters will be at any given time in the day.

Meet up with all the various people and you collect musical snatches of *No More Lonely Nights* - the missing track from McCartney's album. You play McCartney (there's a

Columbia and Magenta creep around the mansion; if they meet you in your clothes are removed and you have to find them.

The sight of naked spirits may prove worrying to some people.

At the beginning of the game you are given a quick lesson in doing the Tie Warp and music from the stage show/film abounds - it's pretty good on the Commodore but unspeakable on the Spectrum (of necessity).

The graphics are pretty

thrill) and you must drive through the streets of London in a souped-up Morris - watch out for sudden turns and other cars.

When you stop at a tube station and wait for a character the screen changes to one of you pacing back and forth. If you've got it right, out pops Linda, Ringo or whoever. The graphics in this section are particularly good - with only a small leap of the imagination you can actually recognise who is supposed to be who.

The final section involves mixing the collected track but I've never made it. I think *Give My Regards* does capture the flavour of the film, at least in superficial ways, such as the music and characters, and also makes a good game. Think of it as a good souvenir of the film rather than a literal representation and you won't be disappointed.

**Program** *Give My Regards to Broad Street* **Price** £7.99 **Micro** Commodore 64 **Supplier** Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB

good, recognisable even. The look of the game reminds me slightly of the excellent *Skool Daze* with detailed backgrounds and small but neatly designed graphics for the various characters. It works, it does remind me of the film and a few quick plays suggest it's going to be pretty addictive as well.

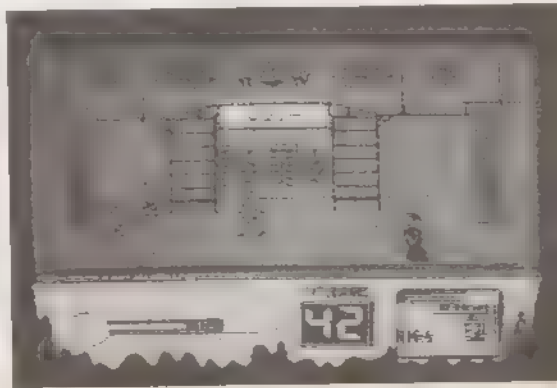
**Program** *Rocky Horror Show* **Price** £8.95 **Micro** Spectrum **Supplier** CRL CRL House, 9 King's Yard, Carpenters Road, Stratford, London E15.

## Tie Warp

*The Rocky Horror Show*? I mean, they can't be serious, can they? I mean, it's a joke, isn't it? A computer game based on the *Rocky Horror Show*? Well, CRL have done it.

Not only have they done it but they have kept it closely to at least the scenes and settings of the script.

The idea is that as either Brad or Janet (you choose - a rare display of no-sexism in the computer industry) you must rescue your opposite half who has turned to stone







# Computers in the movies

## Suspense

The thing most people remember about the movie version of *Alien* is not the action (though the baby alien bursting out of John Hurt's chest is one thing I won't forget in a hurry) but the waiting; the wandering down long, deserted corridors of the Nostromo. And as Alfred

of sound builds up the atmosphere; doors hiss open, a monitor beats faster, a report that an air grille is missing and the room has been trashed comes through.

In addition the characters react individually, so that somebody who's scared isn't going to enter the air ducts. Every so often the ship's cat runs across the screen, giving an extra scare (again, like



Hitchcock, the all-time master of suspense, knew, if you keep the audience on the edges of their seats, when you spring the surprise they'll fall off!

Argus has sensibly tried not to turn the computer version into a zap-the-nasty, but concentrated on the search element. You take the roles of commander, ordering the film's characters around a map of the ship, in touch with only one at a time. Good use

of the original) and when you finally find the alien you get a beautiful picture of it, wagging its tail.

A brave decision not to go for the arcade market, and one which has resulted in a game that's definitely not to be played alone late at night.

**Program Alien Price £8.99**  
Micro Commodore 64, Spectrum Supplier Argus Press  
Software Liberty House, Regent St London W1

## Macabre

Steven Spielberg's latest movie, *Gremlins*, was something of a blockbuster last Christmas, and although *Gremlins - The Adventure* (from Adventure International-

al UK) is unlikely to gross quite as many pennies, it is none the worse for that.

In the graphic adventure mould, it starts off with you (Billy the hero) trapped in your bedroom by a dart-throwing Gremlin, having already been tricked into feed-

## Radical dog

Of all my childhood heroes, Dougal was the most influential. He was a dog before his time. He embodied a life-style that most people would still find radically alternative. And where is he today? He made one movie, and then vanished into obscurity. Some say he lives in isolation with a 500 a day sugar lump habit. Some say he is dead.

Recent hopes of a *Magic Roundabout* revival were raised by the appearance of this game. Would Florence and Dougal once again ride the train around the garden before Mr Zebedee bounced in with a cheery, 'Time for bed'? Sadly the answer is no. The game itself is a classic

attempt to cash in on a legend. The plot is sound, with Dougal trying to collect sugar cubes to build a house, but in play the fun soon palls. Encounters with your Magic Garden friends (which oddly prove fatal) are all too easy, locating where you start the house is tricky and boredom soon sets in.

This could have been good for younger players but even they are likely to lose patience.

I wipe a tear from my eye as I say that Dougal deserved better.

**Program The Magic Roundabout Price £6.95** Micro Spectrum Supplier CRL, CRL House, Kings Yard, Carpenters Road, Stratford, London E15

ing the Mogwai after midnight.

This turns them into evil mischievous nasties, just

Al simply exercising a modicum of good taste!

The graphics are pretty good, with some neat touches



about to overrun your home town of Kingston Falls.

Many elements of the film have been included in the program; the microwave, the blender the department store and even the flasher, so I can forgive the oversight concerning the flying granny as

of limited animation being (I suspect) a nod in the direction of the game's cinematic origins.

The game is also highly playable, with moments of the macabre humour capturing the spirit of the film as well as this format can.

Only one anomaly... Adventure International call this 'an introductory adventure for 12-15 year olds'.

With *Gremlins* the movie rated an AA, work the rest out for yourself!

**Program Gremlins Price £9.95** Micro Spectrum, CBM, BBC, Electron Supplier Adventure International (UK), 85 New Sumner Street Birmingham B19 3TE





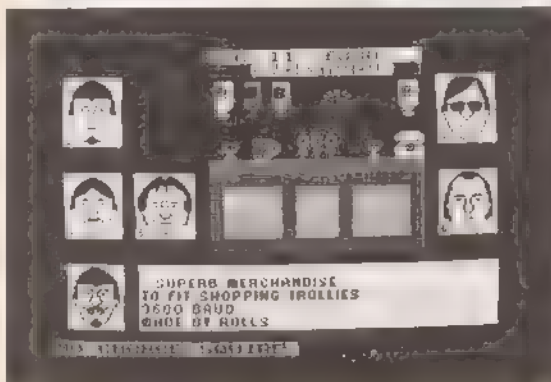
## Double sweet

*Minder* the game had a difficult job ahead of it - how on earth do you try to capture the stylised local world of Arfer Daley and petty criminals?

Don Priestley of DK Tronics reckoned the solution was to

that some thing was 'double sweet'?

Getting the language style into the game is perhaps its greatest achievement. Not only do the computer characters 'speak' in *Minder* talk: "Have I got a lovely little earner for you - only £50" but you can speak back in the authentic tongue. The com-



create a bizarre trading game where you are Arthur and by wheeling and dealing you try to earn your crust and cigars.

The key element to the game is buying things cheaper than you sell them, having found the right dealers and persuaded Terry to lug the stuff around. You also have to watch out for Chisholm the policeman who will scare off your clientele and possibly nab you for dealing in stolen goods.

So, the plot reflects the TV programme fairly well - better than some awful platform and ladders game anyway. The really important quality of *Minder* the TV programme is the language, and arcane fake cockney rhyming slang that surely never existed. I mean, did anyone ever say

puter will understand you ■ you type in, "leave it out, squire, make it £30 and we're talking", mainly because ■ just looks at the figure and knows what to expect.

As you play *Minder*, you find you start to bring the TV programme to the game, talking in adapted East End lingo and wearing a funny hat. It's not a turning point in computer programming but it is fun and does capture as much of the flavour of the TV programme as you could hope for.

Definitely double sweet, my son.

**Program Minder Price**  
£9.95 Micro Spectrum  
Supplier DK Tronics Unit 6  
Shirehill Industrial Estate  
Saffron Walden Essex

## Disappointing

The music may be the same, but fans of Indiana Jones might not find anything else familiar in US Gold's game *Indiana Jones in the Lost Kingdom*.

The two Indy films, *Raiders of the Lost Ark* and *The Temple of Doom*, were deservedly enormous hits. Combining hair-raising stunts, fast-moving action and tongue-in-cheek humour, the films set box-office records and made

a star of Harrison Ford. It's a pity the programmer of the game will never achieve similar success.

*Indiana Jones in the Lost Kingdom* is one of the most disappointing of movie spin-off games.

Without the distinctive figure of Indy on the box, it wouldn't be worth a second look, because it's nothing more than a ladders-and-platforms effort with few redeeming features.

The animation is best described as "average". The

## Tactical

*Airwolf* was a successful TV series about the everyday adventures of a super-duper helicopter that could blast almost anything ■ liked and the people who operated it.

*Airwolf* the game is good as a straight blam-blam dodge and has pretty good, large graphics of the helicopter but there's not really any other point of comparison.

On the other hand the original TV programme was really a kids' comic book brought to life(?), so what could you expect.

The helicopter has to be

sprites are single-colour, which leaves the redoubtable indy looking a trifle pale as he battles through the *Lost Kingdom*.

The loading display tells us that the six chambers ■ the castle indy finds in the jungle are full of hidden treasures and terrible monsters.

In fact, the monsters are wiggly blobs which wouldn't frighten my grandmother (87 and still going strong), and the treasures seem hardly worth winning.

Indy's main strides in the film are replaced with a sideways scuttle in the game, and that's not all that's different about it.

The main element missing is a sense of humour; the best thing about the Indy films is that they can make you laugh even when the heroes are in

carefully piloted past various baddie installations through a series of chambers to rescue a team of trapped scientists - I suppose ■ could have been one of the episodes of the program.

Part of the skill ■ the game is tactical - to open up some sections of the caverns you have to knock out certain specific targets.

I like the game better than the TV programme - I think it's infinitely more realistic.

**Program Airwolf Price**  
£8.95 Micro Spectrum,  
Commodore Supplier Elite  
55 Bradford St Walsall

the trickiest situations. The game, though, tries to replace action and wit with clichéd arcade game set-pieces.

If the films represented a step back to the shallow action adventures of the 30s, then at least they did it well; the game doesn't capture anything of the flavour, and once you've got past the loading screen you'll wish that the *Lost Kingdom* had remained that way.

**Program Indiana Jones in the Lost Kingdom Price**  
£9.95 Micro Commodore ■  
Supplier US Gold, Unit 10,  
The Parkway Industrial  
Centre, Hensage St,  
Birmingham, B7 4LY.





# LODE RUNNER

NOW AVAILABLE FOR YOUR C64

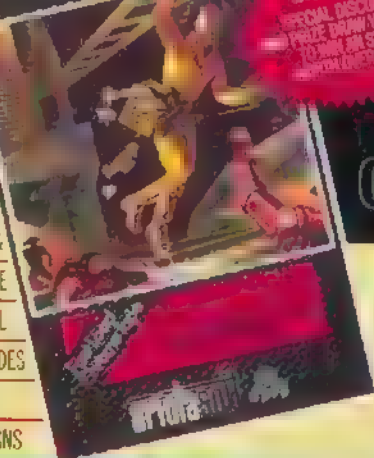
The Bungeling Empire strikes again!  
Your mission is to recover the gold they stole

Lode Runner  
from Broderbund

INCLUDES SPECIAL DISCOUNT PRIZE DRAW ENDS TO WIN AN S&W COUCHMANAGER

## FEATURES

- 150 CHALLENGING SCREENS
- CHEAT KEYS PROVIDING UNLIMITED LIVES & ACCESS TO ANY SCREEN
- VARIABLE GAME SPEED & FREEZE FRAME
- HIGH SCORE TABLE
- JOYSTICK OR KEYBOARD CONTROL
- PLUS PLUS PLUS ALSO INCLUDES SCREEN GENERATOR - ENABLES YOU TO CREATE YOUR OWN SCREEN DESIGNS



Lode Runner is very user-friendly/great fun!  
Lode Runner is a very well thought-out package and is extremely playable. A must for game connoisseurs.  
Tom Hussey

POPULAR Computing WEEKLY

★★★★★

## LODE RUNNER COMPETITION

Send us your best screen design, on cassette or disk, by 30th June 1985, to the address below. It may become one of the best British screens to be included on 'CHAMPIONSHIP LODE RUNNER', for release by Ariolasoft later this year. A prize of a Mini Krugerrand will also be awarded for each screen used.



# PC WORLD

SOFTWARE



## UP IN FIRE



## In graphic detail

**Graham Taylor** looks at the world of commercial computer graphics and find all is not as it seems

**C**omputer graphics in films have a very short history, shorter than you might think.

There is an important difference between some films which used computers for specific, computer-like effects, often as part of a computer system depicted on screen, and those few, more recent films - like *Tron* or *Last Starfighter* - where computer graphics have been used to actually produce sequences of the movie - their advantage is that computer graphics can depict those impossible scenes and objects which animation and models could not achieve.

Films with token computer effects include *2001* (remember the various docking sequences and the dashboard of the shuttle?) some of the 'Death Star Trench' visuals in *Star Wars* and odd 'instrument panel readings' shots in nearly every science fiction film after 1978 including such gems as *Buck Rogers in the 25th Century*.

If you had to choose one film with excellent computer generated graphics it might be the much underrated *Westworld*. *Westworld* envisaged an adult Disneyland where robots, visually indistinguishable from humans, served the wildest fantasies of the human visitors. The vision of the world 'through the robots eyes' took the form of a kind of mosaic of especially digitised pictures which looked as though the robot's vision consisted of a series of discreet blocks. The same technique was recently used in a series of cigarette adverts where the object depicted only became clear when the pictures were viewed from a distance.

In *Tron* many of the moments in the film commonly regarded as computer graphics are in fact animation. The chief computer generated effects are the light cycles sequence (which gave rise to a thousand tedious games) the tanks and the 'recognizers' - platforms on legs. The group responsible for these and a

few other effects were MAGI - the Mathematical Applications Group who used a system called Synthavision to produce the solid object shapes which could then be manipulated in space.

Apart from a top secret and as yet unfinished computer generated movie called *The Works* (some stills of which look astounding), the most recent computer and in some ways the most impressive computer movie so far is *The Last Starfighter*. The main team involved in this film was Digital Productions, some of whom had also worked on *Tron*.

The bulk of the work involved transforming drawings - 'blue prints' - onto models held in the computer. This process was a matter of digitising the pictures as a series of polygons - various flat surface shapes which when combined make up curved as well as flat surfaces.



Once a model was contained in the computer it could be shunted about through space and filmed with different lighting effects also created by the computer. Once a scene was finished the whole mass of data was fed into a Cray which worked a film recorder - a mixture of a film camera and a cathode ray tube which turns the digital data into light. For technology buffs the Cray worked at around a billion computations a seconds. As a comparison with *Tron*, the pictures in *The Last Starfighter* used somewhere between 350,000 to 400,000 polygons per frame. *Tron* used about 7,000. *The Last Starfighter* remains the computer graphic state of the art - for the moment.

But you don't need a Cray to produce computer graphic effects. The likes of the Cray are

available to only a tiny number of giant companies.

Yet computer special effects are big business and do involve a lot of companies.

A contradiction? No, because where computer graphics really count is in the wonderful world of TV ads and logos.

There is one simple reason why computer graphics aren't seen much in movies and are in videos tape (the TV medium) - and that's resolution. To shunt objects around on film convincingly means making thousands of calculations on thousands of pixels whereas for video you only need a resolution of 700 pixels or so. It's the difference between a mere



quarter of a million quid for a Bosch video system or the GNP of a small nation for a Cray.

One of the top companies producing computer graphics to order for adverts is The Moving Picture Company - a firm that specialises in all sorts of film and video work, and sprawls over under and behind an enormous tinted windowed building in Noel Street, London W1.

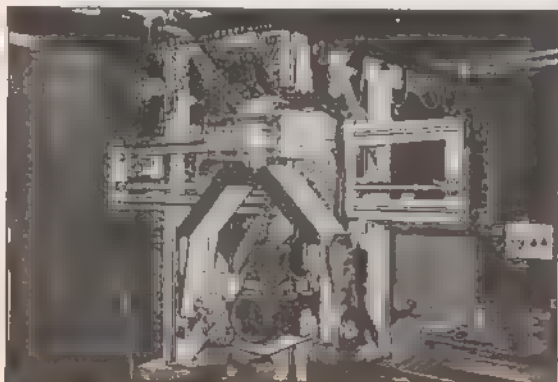
Heading the computer graphics department is Maggie Allison whose friendly but no-nonsense manner is probably part of her success. Despite having been up till three o'clock working the night before, she explained patiently the way the department operates. "We started in computer graphics about three years ago when Mike Luckwell who started the company saw systems working in the States."

The first system used a camera, two Hewlett Packards and output via fibre optic lights. Effects were produced frame by frame using a plotter. The first job was for the Phillips Lazervision system to be in stores to promote the system. "That was followed by work for Hoover and the title sequence for *The Real World* TV programme."

Now the company operates a number of computer systems, the heart of which is a dedicated computer called the Bosch FGS 4000. The machine is actually surprisingly small (an elongated QL) and neatly contained - the set of computer, discs, computer information monitor and picture monitor looking not unlike a souped-up home set. You'd get quite a few QL's for £250,000 though.

Recent work has included commercials for the Halifax Building Society and the Sun Alliance and a logo for TVs.

When a story board is complete the





# Computers in the movies

people who turn that into computer graphics are, surprisingly, not graphic designers or artists but programmers - albeit programmers of a slightly unusual nature. "What I look for from a prospective programmer is the ability to write in Pascal, some 3D experience and the ability to think very logically."

Turn round times for work can be astoundingly brief, a couple of weeks or even days is not unusual - very different from the usual state of the advertising industry where planning and discussion can often take months. The speed gives rise to another important factor in the success of the Moving Picture Companies operation - price. It could cost a mere £20,000 for your ad. Peanuts.

"The computer graphics market is widening, not because computer graphics are becoming more accepted but because it's often cheaper."

One of the surprising problems Maggie faces is the occasional over-enthusiasm of potential clients. "People often don't

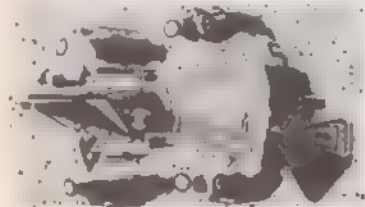
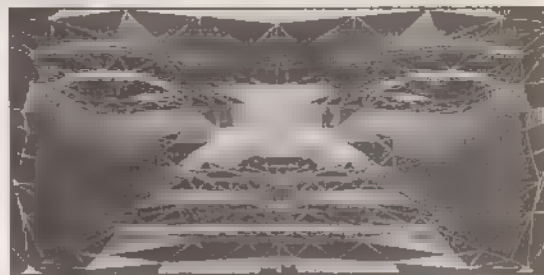
know what is available and think things are computer graphics which are not, things get fashionable and people want them but in fact their needs may be quite different." One thing that is often confused with computer graphics is computerised camera control. "By using a computer for precise control of a camera's movement it is possible to film models in a very realistic way."

There are limits to what the Bosch system can do: "We would have trouble quickly manipulating an image that was very complex like a map. The processing speed of the Bosch does occasionally mean that things can be done in real time but there are ways around it." Dave Throssell who is one of the programmers working with the machine explained: "Since the end result goes on to tape we can simply put the computer images down frame after frame and then speed it up." Dave also told me more about the Bosch system - it uses, wonder of wonders, a 68000. "That's not really what's important, though - all it has to do is deal with the actual control terminal. The clever stuff like scan rates and the

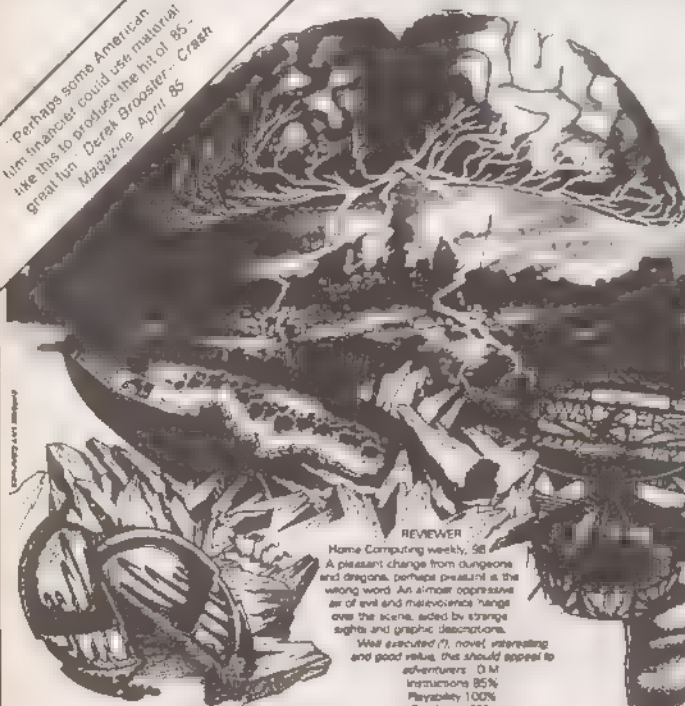
rest is done by a series of special boards." The system has a 4M memory with storage of 100M.

I am always surprised when the expensive 'real' gear looks a lot like your average home micro on screen but the menu of options on the Bosch really does look just like your ordinary... (fill in the name of your micro here). On the other hand the way in which you can generate images is pretty sophisticated.

There may seem to be all the difference in the world between the work of the Moving Picture Company and the glamorous world of the computer effects in *The Last Starfighter* but the way computers open up the world of the imagination is really the same. The objectives may be different but the scale and range of possibilities for computers graphics auger an exciting future.



"Perhaps some American film financiers could use material like this to produce the hit of 86 - great fun. Derek Brooker - Crazz Magazine April 85"



Copyright 1985 by Pacific Software

The macabre and evil dwell within...

## FURTHOUSE

An addictive challenging adventure for the 48k Spectrum & Amstrad CPC



### REVIEWER

Home Computing weekly, 5/8  
A pleasant change from dungeons and dragons, perhaps present is the wrong word. An almost oppressive air of evil and malevolence hangs over the scene, aided by strange sights and graphic descriptions.  
Well executed (?) novel, interesting and good value, this should appeal to adventurers. 0/2  
Instructions 85%  
Playability 100%  
Graphics 100%  
Value for money 100%  
P.P.S.P.P.  
(Spectrum version)

**Pacific Software**

Available by mail order only Amstrad CPC 464 £5.95 Spectrum £3.99 inc.p.p.p.  
Pacific House, 44 Buttermere Grove, Beechwood, Runcorn, Cheshire WA7 2RF. Tel:(09285) 61954

CRL SOFTWARE PRESENT  
RICHARD O'BRIEN'S

# THE ROCKY HORROR SHOW

PLAY IT!

CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD. Tel: 01-533 2916







## The silicon screen

Graham Taylor scrolls smoothly through the history of computer game as computer movie

In the beginning there was a game called *Pong* where two white rectangles moved up and down and a smaller square bounced between them. Or didn't. Then came *Space Invaders* where variously coloured, squarish blobs jerked, rank by rank, left and right across the screen whilst a rectangularish blob moved left and right across the bottom shooting little white lines. Although the various geometric shapes started gradually to look a little more like insects and their movement became a little smoother, the idea that what you were seeing could in any sense be said to have aspirations towards being a movie was absurd.

The idea that a computer game could be graphically sophisticated enough to be compared to film and cartoon only a couple of years old. It developed, obviously, with the technology and in particular with the escape of the arcade game from the three minute straitjacket, ie, when games stopped being one repetitive screen, but instead began to have multiple screens of different kinds.

There is little point in trying to pin the whole thing down to any particular game since the 'movieness' of games is a fairly abstract, ill-defined concept anyway. But for my part games like *Donkey Kong* and *Pacman*, though technically fairly simple, had graphic designs with enough character for people to actually identify them and that brings them, it seems to me, close to being cartoons. The success of *Pacman* had a lot to do with the rolling eyed little ghosts whose design gave them a cute, but horribly determined personality.

The number of screens and the complexity of computer games increased rapidly; more wasn't always better but it could be. One of the games that best

illustrates the current state of the arcade game as movie or cartoon is *Frak!* The basic game idea of collecting some things and dodging other things is here, but the design and the sheer size of the central graphic shape of the caveman makes the game particularly 'cartoonish' and that feeling is a very significant part of the appeal of the game.

It is the quality of the 3D graphic design that has made the two recent Ultimate releases, *Alien 8* and *Knight Lore*, particularly well regarded critically and, more importantly, very successful. Both games feature objects, characters, steps, walls, platforms, etc, which have a solidity, a sense of realness, which like *Frak!* brings the idea of computer games as cartoons another stage further.

But there is more to the idea of games as movies than the quality of the graphics. What about character independence and plot complexity? Until fairly recently the idea of complexity, that a computer game could have enough to it to merit not minutes, but days or weeks of play, was the exclusive province of text adventures.

The text adventure fired the imagination in a similar way to books and radio, where narrative created dramatic images in the mind. Above all, the text adventure had scope; complete worlds of dragons, trolls, caverns, mountains, epic battles, magic, life and death. They have many of the elements of a movie, but lack one crucial ingredient: graphics.

The first step towards mixing the dramatic vision of text adventures with the growing graphics sophistication of arcade games came with the addition of static pictures to illustrate key locations in the adventure. The *Hobbit* did this but

added one more step, the idea of using artificial intelligence techniques to give characters within the adventure a degree of seeming independence. In the *Hobbit* this really only meant two things, sometimes characters would have to be asked for help or information several times before they would provide it and Thorin kept sitting down and singing about the Gold.

The *Hobbit*'s notion of independent characters, however clumsy it proved in practice, was a key stand in the program's success. People liked the idea, in their minds at least it brought 'movieness' closer.

The next step after text adventures with static illustrations and seeming character independence was, inevitably, moving graphics. It happened in various ways, and with varying degrees of success. So programs simply put a little simple animation into the static pictures so that, for example, the torches

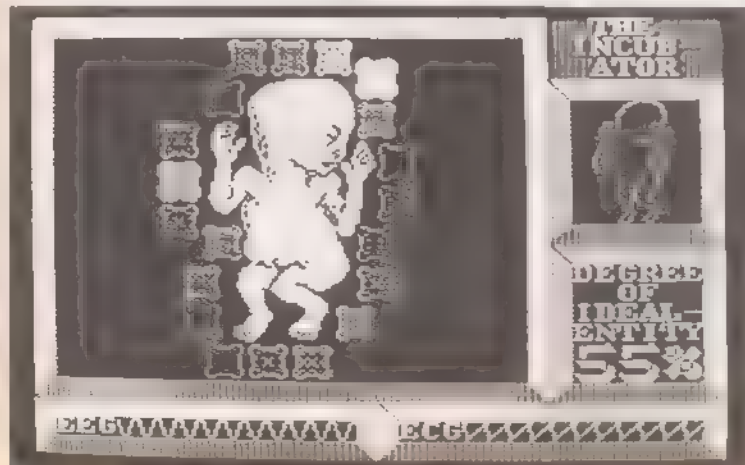


on the wall of the cavern might appear to flicker and burn. It looked pretty, but wasn't and isn't a major step forward towards the computer movie. *Valhalla* was a lot more like it, and was developed by a company whose main objective was to create the first computer movie - Legend. They called *Valhalla*'s operating system Moviesoft.

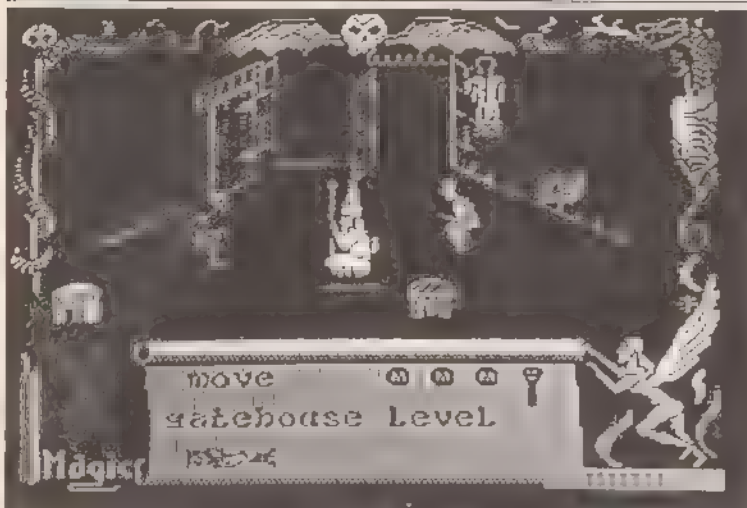
*Valhalla* certainly got some things right. It felt rather like an adventure, but looked like a little film. The character independence may not have been all that much better than the *Hobbit*'s, but instead of being told that Thorin was sitting and singing about gold, you saw a couple of animated characters start a fight by throwing food at one another. *Valhalla* presented something that was more adventure than arcade in feel and scope, but which featured lots of detailed graphics and animated figures.

After *Valhalla* a number of programs were released which all took the movie idea further in one direction or another. *Avalon* from Hewson Consultants featured 3D graphics, combined with a complex plot where all the game instructions could be expressed through joystick commands.

*Deus Ex Machina* used a tape synced to the computer program to bring in music, sound effects and spoken narra-



# Computers in the movies



tive. The end result was powerful but did not sell well, perhaps it didn't seem to be the sort of thing that could be played over and over again.

The true follow-up to *Valhalla* is undoubtedly *Tir Na Nog* which also feels like an adventure, but looks like an arcade game. The plot is complicated and taken from authentic Celtic myth. The task in the game, to recover the parts of a seal, requires extraordinary efforts though

and perseverance. As an adventure it is one of the most difficult ever, yet there is no text input whatsoever and only occasional text information from the computer.

The events in *Tir Na Nog* all happen graphically, and the central hero Cucullainn is one of the most impressive pieces of animation ever seen on a home micro. He strides across the screen like a Celtic Boyver Boy, hair waving in the wind, full of character. Backgrounds are

detailed (a distant volcano can be seen to belch smoke from time to time) and the other beings in the game are fully detailed and, when first discovered, dramatic and impressive.

*Tir Na Nog* looks like a very detailed cartoon, the character independence still isn't totally convincing, but the adventure element is satisfying and the all important 'vision' of the game is vast.

The follow-up to *Tir Na Nog*, *Dun Daroch* promises more characters, more independence (we shall see) and a more detailed playing area. With luck the computer movie will move that bit closer. The next big step will have to be technical: faster computers with more memory for more detailed graphics and ever more complex and vast playing areas. More memory, too, to get the logic of character independence right and make that particular computer illusion work. We might also hope, not just for detailed lifelike graphics, but scrolling and distance effects that can mimic camera styles - from a general long shot to a face close-up.

This time next year it looks as though a 128K computer with a fast 68000 processor, very high res graphics and cheap memory and storage facilities will become a reality in the home market. For those of us watching the pace of development of the computer game as computer movie, things will be heating up.

## Interactive BASIC Programming for 48K ZX Spectrum & Spectrum + ATTENTION ALL SPECTRUM USERS!

LEARN BASIC WITH YOUR HANDS ON THE KEYBOARD, NOT WITH YOUR HEAD IN A BOOK! Now you can learn ZX BASIC programming with your Spectrum. 'Interactive BASIC Programming' is a unique package in twelve parts. Look at these features:

- Plain English (yes, real English not jargonese).
- Due to an amazing programming technique you will have **complete** control over Spectrum BASIC. So you can write, save and load programs while using 'Interactive BASIC Programming'.
- All ZX BASIC is covered.
- You'll learn about graphics (see some on this ad), colour, sound, motion, system variables, menus and much more, explained simply.
- Problems are given with hints and answers in the form of programs that are put into BASIC for you to look at, run and alter.
- You'll learn how to write your own games (by way of examples) and how to put your machine to serious use (e.g. graphs, problem solving, filing system).
- More than 250K (yes, two hundred and fifty kilobytes).
- After sales support at no additional cost: write or telephone if you have any questions about Spectrum BASIC.
- "An educational program which shows real inventiveness - better still it teaches Sinclair Basic."

- Popular Computing Weekly 7/3/85

Britain is the Software Capital of the World - far superior to the U.S.A. The computer revolution is just beginning and as the emphasis shifts from hardware to software WE are best placed to shape the future. The writing's on the wall: get actively involved while the industry is young.

(Amstrad, MSX, Atari 800XL, CBM 64, BBC/Electron versions are in preparation.)

To receive the whole package by return of post send £9.95 (p & p free) to:  
EIGEN SOFTWARE 45 Bancroft Road, Widnes, Cheshire, WA8 0LR  
Tel. 051-423 6201

$H\psi = E\psi$

EIGEN SOFTWARE create reality



# Explosion

A strategy game with explosive tendencies for the Spectrum by Robin Drayton

**E**xplosion is a strategy game for two players played on a square or rectangular playing area. Each player places, in turn, a piece on an empty position or a position that they already occupy.

Each playing position has a maximum number of pieces that it can hold. When this is exceeded the position explodes, sending one piece to each adjacent horizontal and vertical position. These pieces are added to any pieces on the adjacent squares, capturing any pieces belonging to the opponent. An explod-

ing position may make an adjacent position reach its exploding level and thus set off a chain reaction.

A corner position explodes when it has two pieces, a side position when it has three pieces, and interior position when they have four pieces. The game finishes when one player sets off an infinite chain reaction.


The program allows you to choose the size of the playing area, allowing any size from 3 by 3 to 8 by 8. To play a piece, move the flashing cursor to the position required with the arrow keys and then

press 'p' key to place the piece. The program is error trapped, so you will not be able to place a piece on an illegal position.

## Program Notes

185-210 Checking input and moving cursor  
215-235 Checking for chain reaction  
240-285 Computing and printing scores  
1000-1045 Checking for exploding level  
1050-1080 Explosion  
1400-1420 Print name of winner  
1900 Delay loop for moving cursor  
2000-2230 Initialising game

BLA A A A M



```

150 SUB 2000
155 IF INKEY$="" THEN GO TO 155
160 IF INKEY$="p" THEN INKEY$="P" THEN GO TO 195
165 LET p=CODE (INKEY$)
170 LET xi=(p=53)+(p=56): LET yi=-(p=55)+(p=54)
175 IF xi=0 AND yi=0 THEN GO TO 155
180 IF (x=2 AND yi=-1) OR (x=n AND yi=1) THEN (y=2 AND xi=-1) THEN (y=n AND xi=1) THEN GO TO 155
185 LET x=x+yi: LET y=y+xi: POKE k,(PEEK k)+128: LET k=k+256: POKE k,(PEEK k)+128
190 GO SUB 1500: GO TO 155
195 IF ATTR (2*x,2*y)=248 THEN GO TO 205
200 IF (ATTR (2*x,2*y)-128)/8<0 THEN BEEP 1,-10: GO TO 155
205 LET a(x,y)=a(x,y)+1: FLASH 1: PRINT AT 2*x,2*y:a(x,y): FLASH 0: LET q=0: PAPER 7: PRINT AT 2*x+3,1:"": PAPER 1: GO SUB 1500: SUB 1000
210 IF q=0 THEN GO TO 245
215 LET xi=x: LET yi=y
220 FOR x=2 TO a: FOR y=2 TO n
225 GO SUB 1000
230 NEXT y: NEXT x
235 IF q=1 THEN LET q=0: GO TO 220
240 LET x=xi: LET y=yi: POKE k,(PEEK k)+128: LET r=0
245 LET s5=0: LET p5=0: LET s6=0: LET p6=0: FOR q=2 TO a: FOR h=2 TO n: LET b=ATTR (2*g,2*h)
250 IF b=40 OR b=168 THEN LET s5=s5+a(g,h): GO TO 260
255 IF b=48 OR b=176 THEN LET s6=s6+a(g,h)
260 NEXT h: NEXT g
265 PRINT AT 4,30: PAPER 7:"": AT 4,22: PAPER 5:s5:" pieces": IF s5=1 THEN PRINT PAPER 7:AT 4,29:""
270 PRINT AT 9,30: PAPER 7:"": AT 9,22: PAPER 6:s6:" pieces": IF s6=1 THEN PRINT PAPER 7:AT 9,29:""
275 IF st=1 THEN INPUT "Another game? ": LINE p$: IF CODE p$=39 THEN CODE p$=121 THEN CLS : GO TO 150
280 IF st=1 THEN STOP
295 LET i=11-i: PAPER 1: PRINT AT 2*x+3,1:a(i-4, TO b(i-4)): "to move": GO TO 155
1000 IF a(x,y)<1 THEN RETURN
1005 IF a(x,y)=2 THEN LET p=2: GO TO 1020
1010 IF a(x,y)=3 THEN LET p=3: GO TO 1020
1015 IF a(x,y)=4 THEN LET p=4
1020 IF x=2 AND (y=2 OR y=n) THEN LET e=2: GO TO 1050
1025 IF x=n AND (y=2 OR y=n) THEN LET e=2: GO TO 1050
1030 IF p=2 THEN RETURN
1035 IF x=2 OR y=2 OR x=n OR y=n THEN LET e=3: GO TO 1050
1040 IF p=3 THEN RETURN
1045 LET e=4
1050 BEEP 0.1,15: LET a(x+1,y)=a(x+1,y)+1: IF x<n THEN PRINT AT 2*(x+1),2*y:a(x+1,y)
1055 LET a(x-1,y)=a(x-1,y)+1: IF x>2 THEN PRINT AT 2*(x-1),2*y:a(x-1,y)
1060 LET a(x,y+1)=a(x,y+1)+1: IF y<n THEN PRINT AT 2*x,2*(y+1):a(x,y+1)
1065 LET a(x,y-1)=a(x,y-1)+1: IF y>2 THEN PRINT AT 2*x,2*(y-1):a(x,y-1)
1070 LET a(x,y)=a(x,y)-e
1075 IF a(x,y)=0 THEN PAPER 7: BRIGHT 1
1080 PRINT AT 2*x,2*y:a(x,y): BRIGHT 0
1085 LET q=1: PAPER 1: LET r=r+1: IF r>n THEN GO TO 1400
1090 RETURN
1400 PAPER 1: PRINT AT 21,1:a(i-4, TO b(i-4)): "wins": LET q=0: LET st=1
1410 FOR f=1 TO 10: BEEP 0.1,f: NEXT f
1420 GO TO 245
1500 FOR f=1 TO 50: NEXT f: RETURN
2000 DIM a$(2,12): DIM b(2)
2010 INPUT "Name of first player? ": LINE p$: SUB 2230
2020 IF LEN p$>10 THEN SUB 2225: GO TO 2010
2025 LET a$(1)=p$: LET b(1)=LEN p$
2030 INPUT "Name of second player? ": LINE p$: GO SUB 2230
2040 IF LEN p$>10 THEN GO SUB 2225: GO TO 2030
2050 LET a$(2)=p$: LET b(2)=LEN p$
2100 DIM a(10,10): INK 0: PAPER 7: CLS : LET st=0: LET r=0
2105 INPUT "Number of rows on board? (3-8) ": j
2110 IF n<3 OR n>8 THEN BEEP 1,-10: GO TO 2105
2115 INPUT "Number of columns on board? (3-8) ": j
2120 IF n<3 OR n>8 THEN BEEP 1,-10: GO TO 2115
2125 PRINT INVERSE 1:AT 0,22:"SCORES": INVERSE 0:AT 2,22: PAPER 5:a$(1,1 TO b(1)):AT 7,22: PAPER 6:a$(2,1 TO b(2)): LET n=2*n
2130 LET n=n+1: LET n=n+1
2135 BRIGHT 1: FOR x=4 TO 24: FOR y=4 TO 24: PRINT AT x,y:"": NEXT y: NEXT x
2140 FOR x=2 TO n: FOR y=2 TO n: PRINT AT 2*x,2*y:a(x,y): NEXT y: NEXT x: BRIGHT 0: LET i=5: PAPER 1: PRINT AT 2*x+3,1:a(i-4, TO b(i-4)): "to move"
2150 LET k=22660: POKE k,(PEEK k)+128
2160 PAPER 7: INVERSE 1: PRINT AT 11,22:"EXPLODING":AT 12,24:"LEVEL": INVERSE 0
2170 PRINT AT 14,22:"Corners 2":AT 15,22:"Sides 3":AT 16,22:"Interior 4"
2180 PRINT AT 18,21:"Arrow keys":AT 19,21:"move cursor":AT 20,21:"Press P to":AT 21,21:"play piece"
2190 BRIGHT 1: PRINT AT 3,3: "":AT 2*n+1,3: "":AT 3,2*n+1: "":AT 2*n+1,2*n+1: "":
2200 FOR x=4 TO 24: PRINT AT x,3: "":AT x,2*n+1: "": NEXT x
2210 FOR y=4 TO 24: PRINT AT 3,y: "":AT 2*n+1,y: "": NEXT y: BRIGHT 0
2215 LET x=2: LET y=2: PAPER 1
2220 RETURN
2225 PRINT AT 21,1:"Maximum of 10 characters please": BEEP 1,-10: PAUSE 30: RETURN
2230 IF CODE p$>96 THEN LET p$(1)=CHR$(CODE p$-32): RETURN

```



# SOFTWARE ENGINEERS

Three Software Engineers required immediately to work in mid-Somerset. Skills of particular interest are:

- ★ IBM PC (or compatible micros)
- ★ 8086 or Z80 Assembler
- ★ 'C' and/or Pascal
- ★ Image Processing

Current projects are compiler development for a high level language and the implementation of image enhancement and compression algorithms.

These positions offer an excellent opportunity for career progression in a young company for those with drive and ambition.

Send a detailed c.v. to:

**WESSEX SOFTWARE**  
High Street, Evercreech, Somerset  
Tel: 0749 830187

AD101

# PROGRAMMERS

Digital Integration Limited is an expanding software house specialising in high quality original video games.

We require proficient machine code programmers for the design and development of home computer software. Applicants must have an extensive knowledge of Z80 or 6502 assembly language programming, creative talent, self motivation and a strong interest in home computers. CP/M experience would be an advantage.

Highly competitive salaries offered according to experience, plus a profit sharing bonus scheme. Excellent working conditions.

Please send c.v. to:

Digital Integration Limited  
Watchmoor Trade Centre, Watchmoor Road,  
CAMBERLEY, Surrey, GU15 3AJ  
Telephone: 0276 684959



# POPULAR Computing WEEKLY

Take out a subscription to *Popular Computing Weekly* for 12 months and we'll extend it for 5 extra weeks so you get 31 issues for the price of 26. Subscribe for a year and your subscription will run for an extra 10 weeks - 61 issues for the price of 51.

Complete the form below and claim your extra free issues



+ 5  
+ 10

Please enter my subscription to *Popular Computing Weekly* for:

12 months + 5 free issues  
1 year + 10 free issues

UK  
☐ £9.98  
☐ £19.95

Overseas  
☐ £18.70 (airmail)  
☐ £37.40 (airmail)

☐ I enclose a cheque/postal order for ..... made payable to Sunshine Publications Ltd

☐ Charge my Access/Visa Card No. ....

Expiry date ..... Signature .....

Name .....

Address .....

Postcode .....

Which computer do you use? .....

Return this completed form together with payment your to:

**PCW SUBSCRIPTION DEPARTMENT, 12-13 Little Newport Street, London WC2H 7PP, UK**

HAL

## Making a connection

The Call bug strikes again – a new solution presented  
by Dr R K Lowery

The problem of *Calling* machine code routines from large super Basic programs is well documented and a patch, linked into the name table, has been published in *Popular* (Vol 3 No 47). However, an attempt to use this patch, linking it with a small Basic bootstrap then *Running* a large (92K) Basic program ended in a machine crash. One can only assume that *LRUN* recreated the name table thus relinking the bugged Rom routine.

To get over the problem I have adopted a different strategy using a switched service routine linked into the 80 Hz interrupt sequence.

The QL services interrupts by walking along a linked list executing the routines contained in the list. Each link consists of 8 bytes of Ram (two long words) containing a pointer to the next link in the chain in the first (low address) four bytes and the address of the service routine in the other four bytes.

Inserting a link into the list is simplicity itself using a QDOS routine executed via the *Trap* instruction (the address of the new link is passed to the QDOS routine via register A0).

The service routine is set up such that no action is taken if the switch byte is non-zero. If the value is zero then the routine to be *Called* from Basic is executed and the switch reset to a non-zero value. The switch byte is located with the machine code in the resident procedure area where it is safe from relocation by QDOS and its address (relative to *Respr(O)*) is known to Basic programs. Therefore a Basic program can poke the switch byte to zero thus effectively *Calling* the application routine. Passing of parameters can be effected by *Pokeing* addresses known both to Basic and the machine code routine (fixed with respect to *Respr(O)*).

In the example given, the interrupt service routine is 'armed' and the large Basic program run using the small bootstrap routine:

```
100  a = Respr(O)
110  LBYTES mdv1-code,a
120  CALL a
130  LRUN mdv1-main
```

Each call to machine code in the Basic program 'main' requires the following series of Pokes.

```
100  ad = RESPR(O)
110  POKE ad + 5,value-1
120  POKE-W ad + 6,value-2
130  POKE-W ad + 8,value-3
140  POKE ad - 4,0
```

This is equivalent to *Call ad,value-1,value-2,value-3*, as the service routine loads

D1 (byte) and D3 (word) from the addresses poked by Basic.

The example given is relatively simple, enabling a single machine code routine to be executed. However, there is nothing to prevent extension of the technique, possibly using a bit mask instead of a complete byte to control the switching in of the application routines.

LOC	OBJECT	STMT	SOURCE STATEMENT
		5 #	
		6 #	
		7 #	JUMP table for subroutine entry
		8 #	Point (4 bytes)
0000'	6000 0010	9	ERR SETUP
		10 #	
		11 #	Switch byte - initialised to off
		12 #	
0004'	01	13 DAREA	DC.B 1
		14 #	
		15 #	Parameters Passed to/from BASIC
		16 #	In this example 5 bytes are
		17 #	assigned to three Parameters.
		18 #	
0005'	=0001	19	DS.B 1
0006'	=0004	20	DS.W 1
		21 #	
		22 #	8 bytes reserved for the new
		23 #	entry in the 50 Hz interrupt
		24 #	linked list
		25 #	
000A'	=0008	26 LINKL	DS.L 2
		27 #	
		28 #	Link in interrupt service
		29 #	Address of linked list entry is
		30 #	stored in A0. The address of
		31 #	the service routine is stored
		32 #	in the top 4 bytes. The QDOS
		33 #	routine is executed by setting
		34 #	D0 to A1C and calling TRAP#1.
		35 #	
0012'	41FA FFF6	36 SETUP	LEA LINKL,A0
0016'	701C	37	MOVEQ #A1C,D0
0018'	43FA 000E	38	LEA INTSER,A1
001C'	3209	39	MOVE.L A1,D1
001E'	2141 0004	40	MOVE.L D1,4(A0)
0022'	4E41	41	TRAP#1
0024'	42B0	42	CLR.L D0
0026'	4E75	43	RTS
		44 #	
		45 #	Interrupt service routine
		46 #	Stack A0 and ascertain switch
		47 #	byte status.
		48 #	
0028'	2F08	49 INTSER	MOVE.L A0,-(A7)
002A'	41FA FF08	50	LEA DAREA,A0
002E'	4A18	51	TEST.B (A0)
0030'	6700 0006	52	BEQ EXEC
		53 #	
		54 #	Switch non-zero, restore A0
		55 #	and return.
		56 #	
0034'	295F	57	MOVE.L (A7)+,A0
0036'	4E75	58	RTS
		59 #	
		60 #	Routine required to execute
		61 #	Stack remaining registers.
		62 #	
0038'	48E7 FF7C	63 EXEC	MOVE.L #A1-AS/D0-D7,-(A7)







LEGEND



## Without a trace

The second part of the Tracer project for the BBC B written by Calvin Woodings

Last week we presented the first part of the four part series building up database software dedicated to index creation and searching. We listed the program used to create new indexes which is called when you select Option 4 from the menu of the main program.

This week we start work on the main program and provide the Menu routine, the Search Index option, and the procedures needed to Load and Save the indexes you create. The last part of the main program will be given next week.

### Main Program Notes

Space becomes more critical at this stage, and you should exclude the *Rems* and blank lines which have been added to the listing to improve clarity.

As was the case last week, the 'y' and 'g' characters within the print statements refer to the yellow and green teletext colour codes which are entered using the shifted function keys.

**Line 70** - initialises the variables and sets up the error trap. *HIMEM* is the index start address and is the address used to store the heading created by the New Index program. (If you are able to use a program compactor after you've got *Tracer* working properly, you can reduce *HIMEM* to *&1FD0* and increase the number of records your index will store. If you are careless and leave too many extra spaces, you may get the dreaded *No Room* error and have to set *HIMEM* to a higher value until you've tidied it up.) *f%* stores the number of bytes left in memory for use by the index. *E%* contains the Y coordinate of the last

line on the screen in display mode. *F%* is a flag used by the display. *l%* is a frequently used constant. *K%* is a flag used by the print routine. *P%* and *S%* are string storage buffers, and *I%* is the address at which the index name is stored.

**Line 80** - prints the Menu screen. Your selection from the menu is stored in *O%* by *FNmn* and inputs from 1 to 5 cause the selection of the relevant procedure by *PROCop*. If you select option 8, ie, you choose to leave *Tracer*, the screen is cleared, and you are given a last opportunity to save the index before finishing.

**Line 90** - ensures that *Escape* (error number 17) returns you to the menu. Other errors are reported. (This line will be altered to accommodate the machine code print routine in the last part of the series.)

**Line 100** - traps the *File Not Found* error (*&D6*) which occurs if you try to load an index which is not on the disc in the drive. It clears the name you entered by poking a carriage return into the filename address (*74% = 13*) and then uses the *Info* command from your DFS to display the indexes on the disc (ie, those files in the 'I' directory).

**Line 110** - waits for a key press before returning to the menu.

**Line 120** - *PROCop* takes the option in *O%* and calls the procedure which provides the service you require.

**Line 130** - *FNmn* prints the menu. Note the use of a window (*VDU28*) to avoid a series of *Printab(x,y)* statements which would have used more space. After removing the window, screenline 21 is cleared and the input routine is used to get your selection.

**Line 140** - *PROCr* sets up the screen format,

and the parameter *SP%* carries the screen title which is printed out at the top in double height letters.

**Line 150** - the start of the vital search index procedure *PROCse*, uses *PROCr* to make sure a valid index name is present, and commences the loop which is concluded at Line 220. *H%*, the flag which when true indicates that the word you are seeking has been found, is zeroed, and the screen heading becomes the index name (*PROCr*). Some on screen help is provided, and the input routine loads *S%* with the object of your search. *PROCr* prints out the index header line, the cursor position indicator (*l%*) is set to start on Line 8, and the variable *D%* is loaded with the address of the last record in the index.

**Line 160** - sets up a loop to step from the start of the index to the end in 40 byte clocks. (If you remember from last week, the 40 bytes following *HIMEM* contain the index header, and the next 8 bytes contain the field count and length data.)

**Line 170** - uses the very fast *Instr* command to see if your keyword in *S%* is contained in the 40 byte record starting at address *N%*. If it is, *Z* becomes true, and if there's room on the screen to print the record out, ie, if *L% = E%*, then the record is printed. The screen line count is increased by one, and the keyword-found flag (*H%*) is set to true.

**Line 180** - resets the screen line count to six if the last record printed went on the last available line. *PROCco* waits for a keypress before restarting the loop.

**Line 200** - prints blank lines to clear any printout left over from previous screens.

**Line 210** - checks the keyword found flag and prints up the necessary message if it was not set.

**Line 220** - allows you to stay in the Search option until you respond with a 'Y' to the Quit Search question.

**Line 230** - is the procedure used to Load indexes into memory. The screen is set up, the index name you type in is put into memory

```

10 REM TRACER: A SUPERFAST INDEX CREATION AND SEARCH PROGRAM
20 REM BY C.R. WOODINGS (C)1985
30
40 REM MAIN PROGRAM PART 1 OF 2
50
60 REM*****
65
70 MODE7: HIMEM=&20D0: JX=&7B48-HIMEM: EX=19: F%=0: I%=40: K%=0: P%=&C00: S%=&C50: f%=
&CA0: ONERROR GOTO 90
80 REPEAT: O%=FNmn: PROCop: UNTIL O%=6: CLS: IF FNyn(12, "Save Index") PROCsv: CLS EL
SE END
90 IF ERR<>17 CLS: REPORT: PRINT " at "; ERL ELSE GOTO 80
100 IF ERR=&D6 ?f%=13: PRINT "Indexes: " : *info I. *
110 PROCco(21): GOTO 80
115
120 DEF PROCop IF O%=1 PROCse: ENDPROC ELSE IF O%=2 PROCad: ENDPROC ELSE IF O%=3 P
ROCDf: ENDPROC ELSE IF O%=4 CHAIN "NEW": ENDPROC ELSE IF O%=5 PROCsv: ENDPROC ELSE E
NDPROC
125 REM The first 'y' in the Menu lines are yellow teletext codes <SHIFT f3>
126
130 DEFFNmn PROCr("TRACER"): VDU28, 12, 18, 38, 9: PRINT "1ySearch Index" "2yAdd Reco
rds" "3yDisplay/Edit" "4yStart New Index" "5ySave Index" "6yQuit": VDU26: PRINTTAB
(0, 21) SPC39: PROCpr(20, "yEnter Option ") := VALFNin(1, 48, 55)

```

at P%, and the necessary \*Load command line is assembled at P% (ie at &C00). Note the use of Str\$ to convert the HIMEM address into ASCII codes so that it can be read by the command line interpreter at &FFF7. (See UC page 483 for details.) Finally, the index length is read into W% direct from the OSFILE control block used by the basic \*Load command.

**Line 240** - starts the index save procedure by setting up the screen and preventing you from saving a blank index.

**Line 250** - unlocks all the files in the 'I' directory.

**Line 260** - uses the command line interpreter to \*Save the index (see Line 240 above). It then locks the index so that the new index routine you typed in last week will not accidentally erase a valuable index.

**Lines 280-390** - are the same as Lines 360 to 480 from last week. If you want to avoid retyping them, and are thoroughly familiar with merging programs as described in the User Guide page 402, you can save a little time by extracting them from New, renumbering them, and transferring them to this program.

**Line 400** - prints out the index header line

which you stored at HIMEM with the New Index routine.

**Line 410** - checks to see if an index has been loaded, and if not it loads one.

**Line 420** - gives you an opportunity to change the index whenever PROCfn is called.

That's all for this week. The remainder of this program, Lines 440 to 660, will be in next week's magazine, along with the !Boot program which loads it all at the right place.

Remember, if you would like to have the whole series up and running on a 40 track disc, send £12 to the author at 12 Copswood Avenue, Nuneaton, Warwicks CV11 4TQ.

```

135
140 DEFPROC($P%) CLS: $P%=CHR$131+CHR$141+$P%: PROCPr(1, $P%): PROCPr(2, $P%): PRIN
TTAB(0, 3)CHR$145 STRING$(39, ""); PRINTTAB(0, 22)CHR$145 STRING$(39, ""); PROCPr(21
, "y<ESC> For MENU"): ENDPROC
145
150 DEFPROCse PROCfn: REPEAT: H%=0: PROCT($f%): PROCPr(11, "yEnter Keyword"): PROCPr
(20, "y<SPC><RTN>yto browse."): PRINTTAB(14, 13);: $S%=FNin(12, 31, 132): PROCT("Search
ing "+$f%+" Index"): PROCPr: L%=6: D%=HIMEM+W%-I%+48
160 IF FNyn(11, "Print it")K%=TRUE: CALL&A10
170 FOR N%=HIMEM+48 TO 0% STEP I%: Z=INSTR($N%, $S%): IF Z AND L%<E% AND NOT K% PR
INTTAB(0, L%)$N%: L%=L%+1: H%=TRUE ELSE IF Z PRINT$N%: H%=TRUE
180 IF NOT K% IF L%=E% PROCco(20): L%=6
190 NEXT: IF K% CALL&A98: PROCT("Search"): K%=0
200 FOR X%=L% TO E%: PRINTTAB(0, X%)SPC1%: NEXT
210 IF NOT H% PROCPr(13, "r"+$S%+"gnot found")
220 UNTIL FNyn(20, "Quit Search"): ENDPROC
225
230 DEFPROCld: PROCT("Loading"): PROCPr(12, "yEnter Index Name"): PRINTTAB(16, 14);:
$F%=FNin(7, 31, 97): $P%="LOAD I. "+$F%+" "+STR$(HIMEM: X%=0: Y%=&C: CALL&FFF7: W%={!&2
F8 AND &FFFF)-48: ENDPROC
235
240 DEFPROCsv PROCT("Saving "+$f%): IF $f%=""PROCPr(12, "No Index to Save"): A=IN
KEY(200): ENDPROC
250 *AC. *.
260 $P%="SAVE I. "+$f%+" "+STR$(HIMEM+" "+STR$(W%-HIMEM+48): X%=0: Y%=&C: CALL&FF
F7: *AC. I. * L
270 ENDPROC
275
280 DEFFNyn(U%, $P%): LOCALans: =FX15, 1
290 PROCPr(U%, "g"+$P%+" {Y/N} ? N"): VDU8: ans=(GETAND&OF): PRINTTAB(0, U%)SPC30: =
{CHR$ans="Y"}
295
300 DEFPROCco(U%): =FX15, 0
310 PROCPr(U%, "y<RETURN> to continue"): REPEATUNTILGET=13: PRINTTAB(6, U%)SPC30:
ENDPROC
315
320 DEFFNin(V%, loASC, hiASC): VDU23, 1, 1, 0, 0, 0;: =FX202, 32
330 LOCALK%, Z%: K%=0: ?$S%=&D
340 PRINTSTRING$(V%, ".");: " "; STRING$(V%+1, CHR$0);: =FX15, 1
350 REPEAT: Z%=GET: IFZ%=127 AND K%>0 K%=K%-1: $S%=LEFT$(S%, K%): VDUZ%, 46, 8: GOT03
80
360 IF Z%>loASC AND K%<V% AND Z%<hiASC K%=K%+1: $S%=$S%+CHR$Z%: VDUZ%: GOT0380
370 IF NOT (Z%=13 AND K%>0) VDU7
380 UNTIL Z%=13 AND K%>0: =S%
385
390 DEFPROCPr(U%, $P%): PRINTTAB(0, U%); SPC39: PRINTTAB((I%-LENSP%)/2, U%)$P%;: ENDP
ROC
395
400 DEFPROCch: PRINTTAB(0, 4)$HIMEM: ENDPROC
405
410 DEFPROCfn: IF$f%=""PROCld: ENDPROC ELSE PROCT($f%)
420 IF FNyn(12, "Change Index") PROCld
430 ENDPROC

```



# Sounds amazing

The final part of the utility for all Commodore music lovers –  
Synthesiser by Gareth Thomas

The next thing to do is select which voices are to be filtered, 1-3. Typing "123" (return) will set all voices to be filtered. Finally you are asked if you wish filter sweep. If you type "Y" for yes you must enter the speed in the range 0-99.

Press F7 on the menu to return to the main menu. Next on the main menu is Effects, so press F3. The bottom line should now look like this: F1-Sync, F3-Resonance F8-Ring Mod F7-Exit.

Both Sync and Ring Mod will switch to the opposite state when pressed, i.e. if the Sync is already on (it should be white) it will turn off. For details on how to use Synchronisation and Ring Modulation see programmers reference guide page 463 and 207.

The Resonance (F3) is the depth that is

given after passing through the filter. it has a range of 0-15, so just type in the value and press return.

On the main menu, next is FS-Voice. If you have been using the program up to now, you'll probably have noticed that all values typed in (except the filters) will have changed only Voice 1 on the far left. To change the parameters of other voices press F5 and select your Voice 1-3 and select whether you wish it on or off.

Finally on the main menu press F7 to hear your sound, and the new bottom line should look like this: F1-Duration, F3-Frequency, F5-Play, F7-Exit. The duration of the note is initially set at 1000 but this can be changed by pressing F1. Now enter a number 1-9999, (this number being only an arbitrary value not representing any time scale).

Next on the menu is Frequency. Press F3 and you will be prompted to enter the voice you wish to change, then you must type in the frequency. This is in the form shown on Page 161 of the user manual with a high and low value. Finally pressing F5 will play the note, and again F7 to return to the main menu.

If you've managed to follow everything so far, I've included an example to help you, it uses many of the features of the program.

## Example

```
AT=1 DC=2 S=4 R=4
Pulse Waveform H=3 L=128
Filters H. Pass & L. Pass
Cutoff H=12 L=1
Voice *1 only Resonance + 15
Fswep=25
Duration=250
```

Try changing the waveform to Noise and slowing the sweep – you get a train type sound. With a lower frequency it sounds like a chugging beat.

```
5051 IFS="L"ANDF1=0THENFL=FL+16 AC=55872 GOSUB3500 F1=1
5052 IFS="H"ANDF2=0THENFL=FL+32 AC=55863 GOSUB3500 F2=1
5053 IFS="B"ANDF3=0THENFL=FL+64 AC=55880 GOSUB3500 F3=1
5060 NEXT
5065 CL=14
5070 IFF1=0THENAC=55872 GOSUB3500
5080 IFF2=0THENAC=55863 GOSUB3500
5090 IFF3=0THENAC=55880 GOSUB3500
5100 IFS="O"THENPOKEAD+24, (PEEK(AD+24)AND248:RETURN
5101 POKEAD+24,15:FL
5101
5104 REM SET CUTOFF FREQUENCY
5105 REM [CRP] [CRR] [RVS ON] [RVS OFF]
5110 PRINT""; "1) CUTOFF FREQ"
5120 LN=4:GOSUB2500:IFS="E"THEN5200
5121 ILEN(MS)=1:THEN5120
5123 S=MID$(MS,1,1):IFS="H"ANDS="C":L"THEN5120
5125 IFS="L"THENILEN(MS)>20RVL(MID$(MS,2,1))>7THEN5120
5127 IFS="L"THENPOKEA4293,VAL(MID$(MS,2,1)):CL=1684:GOSU
B2700:GOTO5120
5130 FORLR=2TOLEN(MS):S=MID$(MS,LR,1)
5130 IFS=(S)<48ORASC(S)>57THEN5120
5160 NEXT
5170 VL=VAL(MID$(MS,2,LEN(MS)))IFVL<8ORVL>255THEN5120:C
U=VL
5175 IFVL<10THENH1=MS+" "
5180 POKEA4294,VL:CL=1676:GOSUB2700:GOTO5120
5190
5191 REM SET VOICES TO BE FILTERED
5192 REM [CRP] [CRR] [RVS ON] [RVS OFF] [CRD]
5200 PRINT""; "2) VOICE?"; "1-LN=3 F1=0 F2=0 F3=0
5210 GOSUB2500:IFS="E"THEN5340
5220 FORLR=1TOLEN(MS):S=MID$(MS,LR,1)
5240 IFS=(S)<48ORASC(S)>57THEN5210
5250 IFS="1"ANDF1=0THENF1=1:FT=FT+1
5260 IFS="2"ANDF2=0THENF2=1:FT=FT+2
5270 IFS="3"ANDF3=0THENF3=1:FT=FT+4
5280 NEXT
5290 POKEAD+23, (ECM16)+FT:LN=1:CL=1:CP=1:FORLR=1TO2
5300 IFF1=0CPHENPOKE56825,CL
5310 IFF2=0CPHENPOKE56825,CL
5320 IFF3=0CPHENPOKE56833,CL
5330 CL=14:CP=0:NEXT
5335 REM [3*CRP] [CRR] [RVS ON] [RVS OFF] [2*CRD]
5340 PRINT""; "3) SWEEP?"; "Y-N" LN=1:GOSUB2500
5350 IFS="Y"ANDH1="C":N"THEN5340
5360 IFS="N"THENRETURN
5365 REM [3*CRP] [CRR] [RVS ON] [RVS OFF] [2*CRD]
5370 PRINT""; "4) RATE?"; "MM" LN=2:GOSUB2500
5380 FORLR=1TOLEN(MS):S=MID$(MS,LR,1)
5400 IFS=(S)<48ORASC(S)>57THEN5370
5410 NEXT
5420 S=VAL(MS):IFSL<10THENH1=MS+" "
5430 CL=1696:MS=" "H1:GOSUB2700:RETURN
5500
5600 REM PLAY SOUND
5601
5602 REM SET WAVEFORMS
5603 REM [CRP] [25*CRP] [RVS ON]
5604 PRINT""; "5) WAVEFORM?"; "0-15" F5=PLAY"
5605 IFV(1)THENPOKEAD+4, V(1)+SV(1)+RM(1)
5606 IFV(2)THENPOKEAD+11, V(2)+SV(2)+RM(2)
5607 IFV(3)THENPOKEAD+18, V(3)+SV(3)+RM(3)
7010 FORDD=1TODR:IFS=THENH1GOSUB2700 DD=DD+25
7012 NEXT:IFPEEK(203)<64THEN7000
7013
7015 REM START RELEASE(RESET GATE)
7020 POKEAD+4, V(1)-1:POKEAD+11, V(2)-1:POKEAD+18, V(3)-1
POKES+22, CU
7030 POKE198,0:RETURN
7060
7490 REM [CRP] [CRP]
7500 PRINT""; "F1-DURATION F3-FREQUENCY F5-PLAY F7-EXIT"
7510 GETO:IFS=" "THEN7510
7520 IFS=(G)<133ORASC(G)>136THEN7510
7530 IFS="CHR(136)THENRETURN
7540 ONASC(G)-132GOSUB7700,7595,6950
7545 REM [3*CRP] [CRR] [RVS ON] [RVS OFF] [2*CRD]
7550 PRINT""; "1) OPTION?"; "MM" GOTO7500
7555 REM [CRP] [12*CRP] [RVS ON]
7595 PRINT""; "3) F3-FREQUENCY"
7596 REM [3*CRP] [CRR] [RVS ON] [RVS OFF]
7600 PRINT""; "4) VOICE?"; "1-LN=1
7610 GOSUB2500:IFS="C":CRH="3"THEN7600
7620 VC=VAL(LN)
7630 REM [CRP] [CRR] [RVS ON] [RVS OFF] [CRD]
7635 PRINT""; "5) FREQ?"; "MM" LN=4
7640 GOSUB2500:IFS="E"THENRETURN
7620 S=MID$(MS,1,1):IF S="C":H"ANDS="C":L"ANDS="C":E"THEN7610
7630 FORLR=2TOLEN(MS):S=MID$(MS,LR,1)
7650 IFS=(S)<48ORASC(S)>57THEN7610
7660 NEXT
7665 VL=VAL(MID$(MS,2,LEN(MS)))
7670 IFVL<255THEN7610
7680 S=MID$(MS,1,1):IFS="L"THENPOKEAD+((VC-1)*7),VU
7690 IFS="H"THENPOKEAD+1*((VC-1)*7),VU
7695 GOTO7610
7699 REM [CRP] [RVS ON]
7700 PRINT""; "6) F1-DURATION"
7710 REM [3*CRP] [CRR] [RVS ON] [CRD]
7705 PRINT""; "7) DURATION?"; "LN=4
7710 GOSUB2500:FORLR=1TOLEN(MS):S=MID$(MS,LR,1)
7720 IFS=(S)<48ORASC(S)>57THEN7710
7730 NEXT:DR=VAL(MS):IFDR=0THEN7710
7735 RETURN
7725
7760 REM FILTER SWEEP
7800 FORT=1TO255STEP54:POKEAD+22,T:NEXT:RETURN
7890
8800 REM SET SID CHIP+MAIN VARIABLES
8900 AD=54272
8905 IFV(1)=17 V(2)=17-V(3)=17-V=1:DR=500:VO(1)=1-VO(2)=0:
VO(3)=0
8906 CL=" "
8907 PRINTCHR$(142)CHR$(8)
8910 FORL=8TO24:POKEAD+L,0:NEXT
8920 POKEAD+24,15
8930 POKE650,128:POKE198,0
8931 POKE3281,6:POKE3280,14
8935 POKEAD,195:POKEAD+1,16
8936 POKEAD+7,97:POKEAD+8,8
8937 POKEAD+14,135:POKEAD+15,33
8940 FORL=56136TO56136:POKEAD+L,NEXT
```





# MOVEMEAD DISCOUNT SOFTWARE COMPANY

Spectrum	RRP	Our Price	Commodore 64	RRP	Our Price
Raid over Moscow	7.95	6.95	Ghostbusters	10.95	9.30
Bruce Lee	7.95	6.95	Beechhead	9.95	7.95
Project Futura	6.95	5.45	Bruce Lee	9.95	8.45
Everyone's a Wally	9.95	7.45	Summer Games	14.95	10.30
Daley Thompson	6.90	4.90	Raid over Moscow	9.95	7.95
Knights Lore	9.95	7.20	Stall of Karnath	9.95	6.99
Underworld	9.95	7.20	Tapper	9.95	7.50
Lords of Midnight	8.95	7.95	Bristles	9.95	3.99
Doomsday Revenge	9.95	5.95	Spy vs Spy	9.95	7.95
Paytron	7.95	5.90	Boulder Dash	8.95	6.45
Vahalla	14.95	3.99	Hobbit	14.95	7.99
Blockbusters	7.95	6.75	Daley Thompson Decath	7.90	5.25
Jai Set Willy	5.95	4.46	Fighter Pilot	9.95	7.50
Tir Na Nog	9.95	6.90	Breakover	7.00	5.49
Air Wolf	6.90	5.45	Flip & Flop	9.95	3.99
Monty is Innocent	6.95	4.99	Spy Hunter	9.95	7.50
Great Space Race	14.95	3.99	Impossible Mission	8.95	7.45
Match Point	7.95	4.90	Astro Chase	9.95	3.99
Gill of the Gods	9.95	7.95	Congo-Bongo	9.95	7.95
TriPods	11.50	6.99	Kong Strikes Back	7.90	5.45
Alien 8	9.95	7.95	Up and Down	9.95	7.95
Ghostbusters	9.95	7.45	Hevoc	9.95	4.99
Software Star	8.95	5.95	Chinese Juggler	6.90	2.99
Technician Ted	5.95	4.75	Indiana Jones	9.95	7.95
			Raid Over Moscow	9.95	7.95

All prices include VAT. Postage and packing is **FREE** on orders in excess of £15.00. All orders of less than this amount are charged 0.75p towards the cost. 1,000's of more titles available for all machines. Send a S.A.E. for full list. Send your cheque/P.O. for the full amount (plus postage, if required), to:—



**MOVEMEAD (MARKETING) LIMITED**  
55 ALESBURY STREET  
BLETCHLEY, BUCKS., MK2 2BH Dept PCW  
Telephone: (0906) 79232/3



Order despatched within 3 days of receipt of your order and cheque/P.O. All tapes are offered subject to availability. E&OE.

NEW

— Commodore 64 —

## TURBO-BREAKER

AT LAST, Transfer Turbo games to Disk  
Blank screen, Flashing and picture  
screen turbos by most software houses  
Easy to use.....£10.95

### \*\*\*\*\* TURBO-SAVER \*\*\*\*\*

Make easy Turbo back up copies of  
your slow load games, no user knowledge  
needed, easy to use.....£8.00

### \*\*\*\*\* TRANSFER - MK2 \*\*\*\*\*

Transfer most slow load games to Disk  
Simple to use, and needs no user  
knowledge, or skill.....£8.00

### \*\*\*\*\* DISK - TURBO \*\*\*\*\*

Make your disk games load faster,  
45secs instead of 2mins, does no harm  
to your drive.....£8.00

### \*\*\*\*\* DISKOPY \*\*\*\*\*

A Selective disk copier, fast and very  
easy to use.....£7.00

### \*\*\*\*\* DISK - DOCTOR \*\*\*\*\*

A Disk editor, alter any part of the  
disk, recover a scratched file.....£8.00

## ARROW MICRO SERVICES

20 Portmeadow Walk  
London SE2

PS 13

## DISCS ON A SPECTRUM!

We have obtained a small quantity of floppy disc interfaces for the ZX Spectrum, FIZ BOARDS, which will interface any standard 5 1/4 drive on to your 48K Spectrum. ■ own internal operating system allows you to format discs, store and retrieve both basic and code programmes and files, catalogue, backup, delete files and all the normal disc functions. Powered from the normal Spectrum supply it needs no external supply and plugs straight on to the disc drive.

Complete with blank disc and all instructions.  
Interface only £65 inc VAT, P&P & Insurance.  
Complete system, including drive, only £199.

BBC DRIVES Double sided double density. Drives only £135.  
Boxed with power supply and leads £165

KEMPSTON COMPATIBLE JOYSTICK INTERFACES £5.50 inc P&P.

We also service most types of home computers:  
Sinclair, Commodore, Atari, TI, Oric etc.  
Competitive Rates. Ring for details.

ALL ORDERS: CWO. ALLOW 14 DAYS FOR DELIVERY.

**Electronic Maintenance Services Ltd**  
1397 Lincoln Road  
Werrington  
Peterborough  
PE4 6LT  
(0733) 75025

PS 164

## INFINITE SOFTWARE

**SUPAFILE 150:** An easy ■ use filing system which holds blocks of 150 files. Each file consists of 8 sets of 20 characters. Headings may be altered for books, stamps etc **PRICE £4.99**

**CHARACTER SETS:** Demonstrates and explains how to define and add alternate character sets to your own programs. At least nine different sets including Italics, Digital, Bold face, Gothic Medieval etc. Hi/LO byte calculator included. **PRICE £3.99**

**M/CODE SOUND LIBRARY:** Over ■ different explosions, whizzes and bleeps to add to your own programs. Sound bender and keyboard synthesiser also included. 16/48K **PRICE £3.99**

**INFINITE SOFTWARE TAPE MAGAZINE:** This is our cassette based magazine. Britain's brightest and best tape mag. for 48K only. Helping people of all ages towards better programming. Always 2 or 3 games. Unique features are CURRAH SPEECH throughout. Basic training course. machine code corner, cheats' corner and much more. Back issues available. Great value. **PRICE £2.99**

**STARBOARD:** The Dinghy Racing game for up to 6 players. Great family game. Details available on request. **PRICE £6.95**

All titles are for 48K ZX Spectrum

Send order to.

**INFINITE SOFTWARE**  
73 ALCESTER ROAD, MOSELEY  
BIRMINGHAM B13

PS 167

# When I'm calling you

A selection of useful routines for the Amstrad CPC 464 from the keyboard of Brian Cadge

**T**his collection of machine code and cassette routines should be equally useful to both the Basic programmer and the machine code programmer. To use the program, type in the Basic listing, or the assembly language listing if you have an assembler, and Save it. The Basic program will warn you if you have made any errors in entering the Data statements, in which case you should recheck the listing.

Among the things the program will allow you to do are to enter machine code into Ram, examine the contents of any piece of Ram, set breakpoints in the code for testing subroutines, access the cassette motor, read in a cassette header and display relevant information from it, and write Basic data statements to tape.

To run the program, once loaded into reserved Ram type **CALL 38000**. The '>' character is the monitor's prompt for a command, the following commands are available:

- BYE** —Returns to Basic, or the calling routine
- WRITE** —Writes Basic data statements to tape
- LIST** —Displays a section of Rom or Ram
- START** —Turns on the cassette motor
- STOP** —Turns off the cassette motor
- READ** —Reads and displays information from a header block
- FAST** —Sets the cassette to 2000 baud
- SLOW** —Sets the cassette to 1000 baud
- WIDTH** —Toggles between the 40 and 80 column display
- INPUT** —Allows data to be entered directly into Ram
- REGS** —Displays the contents of the Z80 registers
- CALL** —Calls a machine code subroutine
- BREAK** —Inserts a breakpoint
- JUMP** —Jumps to a given address (used with Break)
- HELP** —Displays a list of these commands

Some commands will ask for more information. For the purpose two other prompts are used; the '#' character means a 16 bit Hex number is required. Four characters must be entered, so to input the number 20(decimal), (which is 14 hex), you would type 0014. The '\$' character means an eight bit hex number is required; here only two characters are required.

Here is a description of the commands in more detail. The **Write** command is used to record an ASCII file on tape, containing Basic data statements starting at line 100. This file can be loaded as a normal Basic program, using **Load** ". This is very useful for anyone who writes

a machine code program using an assembler, and wishes to produce a Basic loader program.

The **Data** statements in the Basic listing for this program were produced using this command. The program will ask for the start address and the length of the code to be put into data statements. It will then ask for confirmation before producing the file.

The **List** command will ask for a start address. A screenful of data is displayed, the program automatically formatting it to fit whichever size display is being used. Pressing any key will continue the list; pressing **Esc** will return you to the command prompt.

To analyse a program's header block, the **Read** command is used. The cassette should be positioned as if to **Load** the program, and the **Play** button pressed. The monitor will read in the first header block it finds and display the following information. The filetype byte character, as given the **Cat** command in Basic, the start address of the program, the length, and the execute address. This is useful mainly for binary files you have saved, but have forgotten where they load and

execute from.

The **Input** command allows you to enter data directly into Ram. After supplying the start address, you can type in the data, each byte separated by the **Enter** key. Press **Esc** when you've finished. This command can be used to enter small test programs, or to quickly change the contents of a memory address.

The **Call** command is used to test subroutines, which should end with a normal **Ret** instruction, to return to the monitor. On return, the values of the Z80 registers are saved, these can be displayed by the **Regs** command.

To enter a breakpoint into a program, use the **Break** command. This asks for the address of the breakpoint and saves the contents of this address, after which it inserts a **RST 30** instruction. Using the **Jump** command to run the program under test, when a breakpoint occurs the monitor will halt the program, display the values of all the usable Z80 registers, and replace the original byte into the breakpoint address.

All the commands are quite straightforward and do not really need further explanation. All commands must be entered as one word, in capitals. The program sets the caps lock on when called so there should be no problem.

Next week, how to add your own commands to the monitor and the remainder of the assembly listing.

## BASIC PROGRAM

```

10 MEMORY 57999
20 FOR I=38000 TO 39625
30 READ A$=VAL("&"+A$):CPC464
40 PEEK I,V
50 NEXT I
60 IF C$(38975) THEN PRINT CHR$(7);"DATA
  ERROR - Check listing!!":STOP
70 CLS:PRINT"Monitor loaded, to call type
  CALL 38000"
100 DATA 3E,01,C0,0E,5C,21,9A,94,C0,F6,95
  C0,65,BC,3E,00,32,C7,84,3E,FF,32
110 DATA EB,84,3E,C3,32,30,89,21,49,9A,22
  31,00,C3,8E,9A,18,20,43,50,43,34
120 DATA 36,34,20,4B,4F,4E,49,54,AF,52,ZF
  43,41,53,53,45,54,54,20,55,54
130 DATA 49,4C,49,54,54,20,4A,20,31,39,38
  34,20,1B,00,0A,0A,00,3E,00,C0,5A
140 DATA 9B,3E,0A,C0,5A,30,C7,7C,00,7D,94
  7D,CB,F0,94,C7,F5,E6,F0,CB,3F,CB
150 DATA 3F,CB,3F,CB,3F,CB,F3,94,32,CE,9A
  F1,E6,0F,C0,F3,94,32,C7,9A,C7,FE
160 DATA 0A,38,03,CB,37,C7,C0,30,C7,CB,D6
  94,3A,CE,9A,CB,5A,BB,3A,C7,9A
170 DATA 5A,BB,CB,C7,00,21,CE,9A,BB,3A,00,00
  7E,00,FE,3A,0B,3E,30,0B,77,00,00
180 DATA 2B,1B,EE,21,30,30,22,CE,9A,21,30
  31,22,CA,7A,C7,E5,CE,21,CA,7A,0A
190 DATA 05,7E,C0,75,BC,23,10,F9,C1,E1,C9
  E5,C5,21,CA,7A,06,04,7E,CB,95,0C
200 DATA 23,10,F9,C1,E1,C9,06,08,21,BC,9A
  11,00,9A,CB,8C,BE,30,7D,CB,23,95
210 DATA 2A,D2,A2,3A,D1,A2,87,20,16,3A,D0
  A2,FE,16,30,0F,B7,2B,25,47,C0,A2
220 DATA 95,3A,28,43,87,20,50,18,19,C0,80
  95,3A,28,43,87,20,52,E5,2A,D0,A2
230 DATA 91,1B,00,87,C7,A2,22,D0,A2,E1,1B
  CB,CB,BF,BC,30,39,C0,06,16,CB,41

```

```

240 DATA 95,C0,30,95,3E,00,32,2B,A3,7E,C0
  0B,94,3A,CE,9A,CB,02,95,3A,C7,9A
250 DATA CB,D2,95,23,7E,01,20,04,3E,0B
  18,02,3E,2C,C0,02,95,10,0F,C0,00
260 DATA 95,C9,C0,95,8C,D8,3E,FF,32,2B,A3
  C9,C0,92,BC,21,E6,95,C0,F6,95,C9
270 DATA 0A,0A,18,45,S3,43,41,50,45,21,10
  07,00,0A,0A,00,7E,B7,C0,C0,5A,BB
280 DATA 23,10,F7,CB,7B,BB,C0,81,BB,21,D4
  A2,06,00,C0,06,BB,FE,7F,2B,10,FE
290 DATA FC,2B,2A,C0,5A,BB,FE,00,2B,17,77
  23,04,18,C9,10,07,20,E5,3E,09,C0
300 DATA 5A,BB,3E,1F,C0,5A,BB,05,2B,10,07
  3E,00,77,3E,0A,C0,5A,BB,C0,84,BB
310 DATA C9,3E,2A,77,23,3E,00,18,EE,FE,41
  10,03,06,37,C9,B6,30,C9,BD,7E,00
320 DATA CB,47,9A,CB,27,CB,27,CB,27,CB,27
  47,07,7E,01,C0,47,96,00,C9,00,21
330 DATA 04,A2,CB,51,76,67,00,23,09,23,CB
  51,96,6F,C9,11,06,96,00,21,F9,76
340 DATA 21,04,A2,1A,BE,2B,0F,1A,FE,FF,2B
  11,13,B7,20,FF,00,23,00,23,1A,EA
350 DATA 07,2B,00,13,23,10,E6,21,52,97,C9
  0B,0E,00,00,66,01,C7,A2,5F,45,00
360 DATA 57,52,47,54,45,00,4C,49,53,54,00
  53,54,41,52,54,00,53,54,4F,50,00
370 DATA 52,45,41,44,00,46,41,53,54,00,53
  4C,4F,57,00,57,49,44,54,00,4B,00,48
380 DATA 45,4C,50,00,49,4E,50,55,54,00,52
  45,47,53,00,43,41,4C,4C,00,42,52
390 DATA 45,41,4B,00,4A,53,49,50,00,FF,FF
  64,97,7F,97,C5,98,57,97,00,97,13
400 DATA 9B,01,9B,0C,9B,84,9B,69,93,93
  CF,97,1B,9A,30,9A,7D,9A,21,37,97
410 DATA C0,F6,95,C0,FF,95,C0,6B,22,24
  A7,C9,21,4B,97,CB,F6,95,C0,FF,95
420 DATA C0,6B,9A,22,2A,03,C9,53,74,61,72
  74,20,61,64,64,72,63,73,73,3A,20

```



03, BE, 9A, 00, 0A, 0A, 0E, 09, 0C, 05, 20  
 570 DATA 74, 79, 70, 65, 20, 00, 00, 0A, 53, 74, 64  
 72, 74, 20, 44, 64, 72, 73, 60, 00, 00  
 580 DATA 08, 4C, 4C, 4C, 63, 74, 63, 20, 20, 20, 20  
 20, 23, 00, 00, 0A, 45, 6E, 74, 72, 79, 20  
 590 DATA 11, 64, 72, 73, 20, 23, 00, 00, 0A, 4F, 4D  
 00, 0A, 20, 0C, 0B, 3C, 28, 09, 3E, 91, 11  
 600 DATA 0F, 8C, 23, 3E, 9A, 3E, 02, 13, F8, 0C, 17  
 91, 21, 4F, 91, 0C, F8, 9C, 2F, 91, 21, 4F  
 A10 DATA 84, A2, FE, 3E, 20, 4F, 91, 21, 4F, 91, 21, 4F  
 1C, 05, 3E, FF, 32, 25, A3, 0C, 11, 8E, 32  
 620 DATA 2A, A3, 0C, 4E, 2B, 0B, 1B, 2A, 2A, A3, 0C  
 CF, 94, 3E, 20, 0C, 5A, 9B, 0C, 5A, 8B, C5  
 30 DATA 00, 0B, 3A, 2A, A3, FE, 01, 28, 02, 0E, 1B  
 3A, 29, A3, 87, 29, 14, C8, A3, 8F, F5, C0  
 640 DATA 0E, 89, F5, FE, 32, 28, A3, F1, 0C, 0C, 89  
 F1, C8, 0C, 8F, 1B, 09, 0C, 09, 89, F5, C0  
 650 DATA 03, 09, 11, 1E, 3A, 2A, A3, 0C, 0D, 94, 23  
 22, 24, A3, 3E, 20, 0C, 5A, 2B, 10, C8, CF  
 660 DATA 24, 74, C1, 10, A8, C0, 00, 00, 89, FE, 20  
 C3, 6E, 9F, 1C, 05, 13, 74, 20, 52, 4F  
 670 DATA 4D, 20, 7B, 31, 7B, 20, 4F, 72, 20, 32, 41  
 4D, 20, 7B, 31, 7B, 20, 3F, 60, 21, A8, 10  
 680 DATA 10, C8, 94, FE, 3E, FE, 2B, 05, 0C, FE, 9B  
 23, C0, C4, 94, C8, F2, C0, C4, 94, C3, 8E  
 690 DATA 9A, C0, 17, 47, 21, B6, 9F, C0, FE, 5, 26  
 24, A3, CF, 94, 21, C4, 99, 39, C0, F6, 10

700 DATA C,D,FF,95,3A,04,A2,FE,2A,2B,1E,0D  
710 DATA C,D,51,9E,2A,2B,45,7F,23  
720 DATA C,D,83,1B,09,C3,0E,9A,4B,69,74  
730 DATA C,D,45,53,43,20,74,6F,20,6A,69,6E  
740 DATA B,67,73,6B,0B,0A,00,20,30,22,23,43  
750 DATA 07,21,8D,7A,21,2C,A3,C0,F6  
760 DATA 95,25,03,02,04,01,0D,6E,00,C0,CF  
770 DATA 75,20,33,0D,04,94,10,EB  
780 DATA C3,0E,9A,7E,75,3B,53,AE,43,2E,AS  
790 DATA 30,10,AS,22,32,43,0D,22,34,AS  
800 DATA FE,22,36,AS,FE,1,22,2C,AS,7A,3B  
810 DATA 23,23,22,67,CV,0D,17,97,3A  
820 DATA 0A,0A,FE,2A,2B,03,2B,7A,C0,FE  
830 DATA C3,0E,9A,7E,75,3B,53,AE,43,2E,AS  
840 DATA 30,10,AS,22,32,43,0D,22,34,AS  
850 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
860 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
870 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
880 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
890 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
900 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
910 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
920 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
930 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
940 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
950 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
960 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
970 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
980 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E  
990 DATA 7A,C0,FE,6B,95,C0,FF,95,C0,6B,9E,7E  
1000 DATA 32,C3,0E,FE,77,7E,3A,3A,C3,0E

	OPC454 Monitor and Cassette Utilization	
	ORG JERRD	
	ENI 3	
	LD R.1	
	CALL HERRD	/Set W mod
	LD HL INTR	
	CALL HERRP	
	CALL HERRS	Initialize
	LD R.0	
	LD C45411.0A	/Set shift
	LD R.050	
	LD C45412.0A	/Set CAPS 1
	LD R.017	/Patch in J
	LD C45410.0A	/for Break
	LD HL REGSR	in RST 30
	LD C45431.0HL	
	LD R.000	
	JP	
INTR	DEFB 24	
	DEFB OPC454 MONITOR-CASSETTE	
	DEFB 104	
	DEFB 1044	
	DEFS 24.12.10.10.0	
LFEEED	LD R.10	
	CALL HERRR	Linefeed
	LD R.10	
	CALL HERRR	
	RET	
PRPG	LD R.0	
	CALL HEXPR	Print 16 b
	LD R.1	in R. 16 b
	CALL HEXPR	
	RET	
HEXST	PUSH AF	Store HEX
	AND 240	16 bit val
	SRL A	
	SRL A	
	SRL A	
	SRL A	
	CALL C4540	
	LD C45401.0A	
	POP AF	
	AND 15	
	CALL C4540	
	LD C45401.0A	
C4540	RET	
	JP 10	
	LD C.010	
	ADD A.55	
	RET	
DIG	LD R.45	
	ADD	
HEXPR	CALL HEXST	Print 8 b
	LD R.45	in R 16 b
	LD R.45	
	CALL HEXST	
LINEING	LD IX. LINE+2	Increment
LINEOP	TNC IX+0	Counter by
	END A.1200	

630	CP	5
640	RET	6
650	LD	7
660	LD	8
670	DEC	9
680	JR	10
690	LD	11
700	LD	12
710	LD	13
720	LD	14
730	RET	15
740	PUSH	16
750	PUSH	17
760	LD	18
770	LD	19
780	CALL	20
790	CALL	21
800	CALL	22
810	CALL	23
820	POP	24
830	POP	25
840	RET	26
850	PUSH	27
860	CALL	28
870	LD	29
880	LD	30
890	LD	31
900	CALL	32
910	CALL	33
920	DJNZ	34
930	POP	35
940	POP	36
950	RET	37
960	LD	38
970	LD	39
980	LD	40
990	CALL	41
1000	JR	42
1010	CALL	43
1020	LD	44
1030	LD	45
1040	OR	46
1050	JR	47
1060	LD	48
1070	CP	49
1080	JR	50
1090	JR	51
1100	LD	52
1110	CALL	53
1120	LD	54
1130	OR	55
1140	JR	56
1150	JR	57
1160	LD	58
1170	LD	59
1180	LD	60
1190	LD	61
1200	JR	62
1210	LD	63
1220	LD	64

```

R
50      Initialize line number
51      for DATA lines to 100
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
106
```

Organised by The Association of London Computer Clubs



CULMINATING  
EVENT  
OF  
LONDON  
FESTIVAL OF  
COMPUTING  
1985  
COMPUTING FOR LONDON

Software, Hardware, Peripherals  
and bits for all mics. Free  
unbiased advice from the clubs  
stands. Bring-and-Buy Sale on  
the Saturday.  
Plus Other Features: Robotics  
Conference, Network Features,  
Community Computing.  
Admission: Adults £2.50; under  
12s £1.50

The Central Hall, Westminster is  
in Victoria Street, almost opposite  
Westminster Abbey, one minute  
from Parliament Square.  
Mainline, Waterloo, Charing  
Cross and Victoria Buses: 11, 24,  
59, 70, 76 and 89. Parking: NCP,  
Aldington Street, Underground: St  
James's Park, Victoria. For stand  
information and availability  
contact Patricia Spilsbury 01-303  
8849

The Personal Computer Show  
For Everyone

## CHEAPEST SOFTWARE

SPECTRUM	RRP	Our Price	COMMODORE	RRP	Our Price
Bruce Lee	7.95	5.95	Pole Position	9.95	7.40
Death Star Interceptor	7.95	6.20	Tin Tin	9.95	7.40
Everyones A Wally	9.95	7.20	Impossible Mission	8.95	6.70
Knightrider	9.95	6.75	Slapshot	8.95	6.70
Underworld	9.95	6.75	World Series Baseball	7.95	5.75
Alien 8	8.95	6.80	Grimm's	9.95	7.40
Dragon Lord (Avatar II)	7.95	5.95	Ghostbusters	10.95	8.25
Spy Hunter	7.95	5.95	Super Rugby	11.95	8.99
Wizard's Lair	6.95	5.20	Regards to Broad St	7.95	5.99
Major Cresta	6.95	5.20	Summer Games	14.95	10.25
Grand National	8.95	5.20	Shark's Hooves	14.95	9.99
Mega Hit 10 Top 100	10.95	14.95	Mega Hit 100 (88 Titles)	19.95	14.95
Dukes of Hazard	8.95	5.20	Air Wolf	7.95	5.95
World Series Baseball	6.95	5.20	Gryphon	7.95	5.25
Technician Ted	5.95	4.50	Loose Runner	9.95	7.75
Grimm's	9.95	7.20	Archie	11.95	8.50
Tin Tin	9.95	6.80	Up & Down	9.95	7.40
Shark's Hooves	14.95	9.95	Spy vs Spy	9.95	8.99
Skull Daze	5.95	4.45	Mini Office	5.95	4.55
Zaxxon	7.95	5.95	Shadow Fire	9.95	7.40
Project Future	6.95	4.99	Super Pipeline II	8.80	6.70
3D Star Wars	5.95	4.45			
Formula 1	7.95	6.95			
Fantastic Voyage	6.95	5.20			
Mighty Mouse	6.95	5.20			
Brian's Boondogs	6.95	5.20			
Air Wolf	8.95	4.99			
Sam's Slot	8.95	4.20			
A Day in the Life	8.95	6.20			
Gift From The Gods	8.95	6.95			
Valkyrie	14.95	4.99			
Get Space Race	14.95	4.99			
Brian Jack Superstar	7.95	5.99			

AMSTRAD	RRP	Our Price
Mini Office	8.80	4.75
Dark Star	7.95	5.95
Technician Ted	7.95	5.95
Brian Jack Superstar	8.95	6.90

All tapes guaranteed genuine. First class delivery,  
same day as order received

P&P Inc. in price UK

75p per tape in Europe £1.00 per tape elsewhere

Send large SAE for full list (state machine)

All computers catered for

When ordering send cheque/PO to:

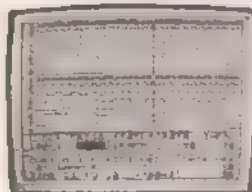
**Bargain Software (Dept PCW6)**

10 Melody Court, Stonehill Rd Estate, London W4 3AW

Ring 01-995 2763 for special offers

PG34

## A PERSONAL LOGIC ANALYSER FOR YOUR SPECTRUM



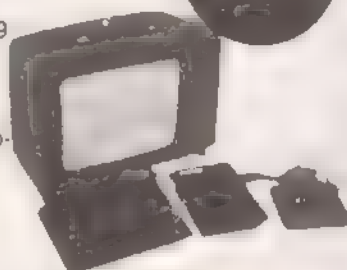
Clip this high  
performance tool  
onto your circuit  
to really see and  
understand exactly  
what it is doing.

● Displays oscilloscope type  
traces of the voltage levels  
(0 or 5v) of 16 points in a  
digital circuit.

● Captures 1999  
samples up to  
10 MHz on  
16 lines.

● Ideal for micro-  
processor work.

● Ready to plug  
into your  
Spectrum



Cheques and requests for information  
to **Seal Electronics** 1 Hagbourne Close  
Woodcote, Reading RG8 0RZ

AVAILABLE SHORTLY

## NEW

### ONLY £19.95

8 BIT CENTRONICS INTERFACE  
MAKE USE OF THAT 8 BIT PRINTER  
PLUGS IN BETWEEN CENTRONICS  
PORT AND PRINTER CABLE

AMSTRAD CPC464 INTERFACES

RS-232

PARALLEL

COMMUNICATE WITH YOUR  
MODEM  
TALK TO OTHER COMPUTERS  
USE SERIAL PRINTERS  
SPLIT BAUD RATES  
STANDARD 25 WAY  
'D' CONNECTOR

**£45.95**

MAKE THAT ROBOT MOVE  
RUN HEATING SYSTEMS  
TWIN 8 BIT PORTS  
OPERATES DIRECT  
FROM BASIC  
2 x 25 WAY SPEEDBLOC  
CONNECTOR

**£25.95**

PRICE INCL. V.A.T. & P.P.

BOTH UNITS CASED AND INCLUDE THROUGH CONNECTOR FOR INTERSTACKING  
■■■■ CONNECTION OF FURTHER ADD-ONS (DISC DRIVE ETC.)  
LITERATURE SUPPLIED AND SOFTWARE ■■■■ TAPE

**K.D.S. ELECTRONICS TEL (04853) 2076**

15 HILL STREET, HUNSTANTON, NORFOLK. PE36 5BS

PG200



# Arcade Avenue



## Games choice

On the day we received our first Games Wizard entry for the BBC B from Martin Geddes of Staines, who has scored 1,016,800 on *Elite*, 49,500 on *Jet Pac* and 548,820 on *Chuckie Egg*, we also received the first, not entirely unexpected, 'Mr Angry' letter. "I would like to criticise your choice of games in the Wizard competition," writes J A Freeman of Leeds. "I own a Spectrum and consider myself to be pretty nifty on both *Jet Pac* and *Manic Miner* yet they only appear on other machines. My latest witnessed score on *Jet Pac* is 836,928; I have had greater scores, but get bored of playing the same game for hours on end. This score is achieved by knowing where to stand!"

Well, I'm afraid you've already partly answered the reason why we avoided those games. Spectrum owners have had nearly two years longer to practise *Manic Miner*, for instance, than Amstrad owners and as dedicated as we are at *Popular* we aren't prepared to stand around the entire weekend watching someone of 2000 times around the clock just because they know "where to stand".

Seriously, though, you wouldn't believe the heartache and arguments we went through to decide on which games to include. For obviously reasons we had to try to avoid those which, once completed, just end. A real problem is those that are marked on a percentage scale that reflects something abstract, such as the number of locations visited, because there is no way of deciding which is the more skilful between a low and a high percentage - a decision that immediately cut out a lot of the latest and best Ultimate releases.

We also had to leave out bug-ridden efforts like Da-

ley's *Decathlon* or *Jet Set Willy*, and we tried to avoid those that fall into the category of this about them. Regarding machine like the Spectrum, which are at the forefront of new software innovation, although we felt we had to include a good alien blast and a platform game, it would have been an injustice to stick with old classics at the expense of the latest and best games such as *Technician Ted* and *Starstrike*. I hope you can begin to appreciate why it was impossible to please everyone with our final choice, and don't forget you don't have to be a wizard at all three games for your machine in order to enter.

Anyway, sticking with *Technician Ted* for the minute - which, if you haven't seen it, has the most amazing loading screen I've ever seen - here are some tips for the game straight from the horse's mouth of Hewson Consultants themselves to get you started. "Technician Ted has a full event processor (no, I don't know what that is either) so that rooms change as the game progresses. If a room looks easy or empty then it is probably not time to attempt it. The order in which tasks must be completed is roughly the same as might be expected during an ordinary working day (sic). The game can be completed within the given limit, but time of the essence.

"Many rooms have been timed so that the skilled player can pass through without pausing provided the correct moves are made. Similarly, it can sometimes be better to deliberately lose a life when a

task is completed rather than follow a tortuous path back to the exit. Collision detection is precise so the starting position of jumps is extremely important. Use of the Pause facility will help here. It can sometimes help to jump vertically and press either left or right whilst Ted is in the air."

Sounds like there's enough to keep people busy for a long time and it may be a good buy for CJ Smith of Westbury who, having finished *JSW*, *Underworld*, *Cavelon*, *Beach Head*, *Manic Miner*, *Sabre Wulf*, *Atc Atc* and *Ant Attack*, wants to know whether I can tell him of any games that would be hard to beat (I expect to see your name in the Wizard competition, CJ!). At the time of writing no one has come close to finishing all 21 tasks in the game, the closest being tasks and if anyone does finish it soon then this Hewson would like to hear from you. Incidentally, CJ, you could also try looking at *Gyron* by Firebird which is said to be mean.

The good news from Hewson is that a follow up TT planned sometime soon. And also, for Commodore owners a game called *Gribble's Day Out* which, as well as being very cute, has the smoothest multi-directional scrolling I can remember seeing - the sort of touch that most people will never notice as long as its well done, but could ruin a game if done poorly. We can also look forward to another game in the *Dragonator*/*Avalon* mould.

The other week someone asked how to get 100% on

*Pyramarama* and the answer comes from Douglas Grant of Leven, Fife, who finished with 100% and 3193 paces on the CBM 64 way back on 27th December. The trick is to make sure that all the objects have been moved from their starting places when you finish. Douglas also wants us to know of his unbeaten run of 115 matches on level 9 of *International Soccer* with a highest win of 9-0. Sign him up someone!

Staying with football games, Stuart Young of Glasgow beat the computer in Ocean's 'excellent game *Match Day*' on 8th December winning 4-2 in the quarter final, 5-2 after extra time in the semi and 'triumphing 3-2 in a hard fought final'. Stuart also has these high scores - *Full Throttle*, 1st on every circuit on a two lap race ('I find it easier and faster to take bends on the outside and never use the brakes'); *Pole Position*, 84,280; *Stop the Express*, 10,030; *Daily's Decathlon*, 449,145 and 580,985 (without cheating).

Let's finish on a light note - Mike Bishop of Cardiff writes, "I have wandered around in *Atc Atc* eating food, unlocking doors, bopping nasties ad infinitum. Could you please give me some indication of what to do with the stupid key sections after I've picked them up as taking them to the front door doesn't get me anywhere. There some subtle nuance which I haven't grasped or am I being incredibly thick?" No comment, Mike, but try putting the key pieces in the right order.

Tony Kendall

## We are searching for the top UK computer games player - the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games - scheduled for release in the autumn.

### Here's how it works

Study the table below and look at the column for the machine you have - these are the games you'll need to master. Send your high scores in on the form below, making sure that your scores are authenticated by a responsible individual signing the form. Any score achieved using technical short-cuts - such as infinite lives codes - will not be accepted.

Between now and September, Tony Kendall will be keeping you up to date on the *Arcade Avenue* page with just who has the scores to beat. Then, in September, the top three scorers on each machine will battle it out for a place in the final and the chance to be the first to play our top secret games.

	Commodore	BBC	Spectrum	Amstrad
Game 1	<i>Surprise Express</i>	<i>Elite</i>	<i>Technician Ted</i>	<i>Serocracy</i>
Game 2	<i>Beach Head</i>	<i>Jet Pac</i>	<i>3D Star Strike</i>	<i>Splint!</i>
Game 3	<i>Shoot the Rapids</i>	<i>Chuckie Egg</i>	<i>Cyclone</i>	<i>Manic Miner</i>

### Game Wizard Entry Form

Micro .....

Game 1 score: .....

Game 2 score: .....

Game 3 score: .....

Name .....

Address .....

.....

.....

Your signature .....

Witness's signature .....

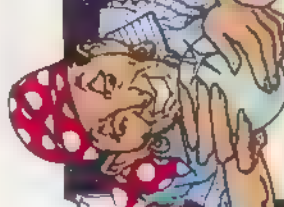
.....



Start a business and know about balance sheets, profit, cash flow, bank loans.



**ENTREPRENEUR**



The best way to look ahead and plan your future.



**FORECASTER**



Need help with figures? work out VAT, PAYE, margins, interest, fractions, square roots.



**NUMBERS AT WORK**



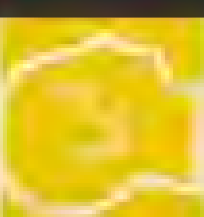
Discover the constellations and learn the secrets of your universe.



**STARWATCHER**



Schedule work, meet deadlines and save time and money.



**PROJECT PLANNER**



Make the most of the opportunities and solve your problems.



**DECISION MAKER**

# Get soft with your micro... and make the best of it with Brainpower

SEND FOR MORE BRAINPOWER TODAY.

Are you really making the best of your micro - are you still using too much of your own 'brainpower'?

We at Collins Soft have some very good news, so simple to use software packages called Brainpower that put your family in control and helps you realise your own full potential.

Skills that will help you make decisions skills that help you plan ahead skills which can help your business skills to discover this universe and skills which will help you organise your work.

With Collins range of Brainpower software you have a Teaching program and Book which show

you how easy Brainpower is to use on your BBC, Commodore or Spectrum. It's the main application program you need.

Discover Brainpower at WH Smith, Books, Musicware and all good Computer Shops or simply post the coupon for information - today.

Read - or Post - your Brainpower. Brainpower is the main application program you need. Discover Brainpower at WH Smith, Books, Musicware and all good Computer Shops or simply post the coupon for information - today.

Brainpower is the main application program you need. Discover Brainpower at WH Smith, Books, Musicware and all good Computer Shops or simply post the coupon for information - today.

Please send me my Collins Soft Brainpower (tick one) ☐ I have one ☐ I want one

Name

Address

Post Code

PCW - 486

**BRAINPOWER**

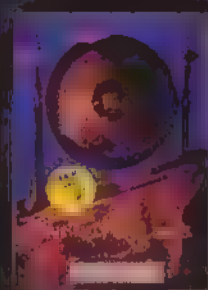
Application through learning

Collins Soft, FREEPOST 30, London W1E 7JZ





# master of the lamps. another piece of magic from activision.



You are the heir to a great fortune. But the crown that was once your father's is almost beyond your grasp. How can you win it back?

First you must fly down an ever-changing corridor of space. Here is flying as it was meant to be. Just you and your magic carpet, flying literally by the seat of your pants.

Reach the end of the corridor and you will meet the first of three Genies who will set you a complex puzzle needing all your skill in colour and sound co-ordination to solve. Do this and the first secret of the lamps will be yours.

But you have only just begun. Another twenty levels of intense challenge, with no less than seven different musical themes are waiting

**ACTIVISION**  
HOME COMPUTER SOFTWARE

## A nice little earner

Graham Taylor talks to the mind behind *Minder*, the game

**Y**ou'd be forgiven for thinking that all that was involved in the production of a computer game based on a popular film or TV program was the handing over of a large sum of money for the right by the software house, followed by a quick rummage in the basement to see what item of dress could be tarted up and shot out into the market place as quickly as possible for some instant bucks before the reviews come out.

Movie spin-offs are frequently so dire that they are almost more feared in the *Popular* offices than platform games with names that alliterate. But there are exceptions - games that really do seem to have been created with the mood and style of the original in mind. *Ghostbusters* was one and it looks as though *Minder* will be another.

But how does a programmer turn film into game? What does he do if someone came up with the idea of a game based on the immortal, inimitable *Minder*? A dreary road chase game? Help Arthur Daley collect the 12 cases of stolen goods and put them in his lock-up, but watch out for the falling plain clothes branch? Thankfully, Don Priestly, programmer of *Minder*, didn't think any of the above were a good idea.

I have, although I wasn't consciously aware of it before interviewing him, always been a fan of Don Priestly's work. In particular, I always loved a management game he did called *Dictator* where through bribery, corruption and maglomaniya you ran a small banana republic as long as you could. *Minder* can be thought of as a sophisticated East End version of *Dictator*.

Don is a whizz middle aged person with a beard rather than a whizz kid. He has a manner you might call businesslike with a smidgen of mad professor. He says of the *Minder* game, "Looking at the program on TV I felt I could create a reasonable or even good program and on balance I think it has turned out to be good." From an hour or so looking at it I would say it is better than good, but then Don just isn't the sort of person who could say Megal with a straight face let alone an exclamation mark.

Was Don a *Minder* fan prior to writing the game? "Well, to be honest, I don't watch TV much but if *Minder* was on I did stop to look at it. When developing the game I watched every episode I could and videoed them to view them again to try to get the right feel."

What conclusions had he drawn? "It seems to me there are several ingredients in the shows I had ■ get into the game: firstly it is about people and not

just cardboard cut-outs, secondly it has a very distinct series of locations and language, and finally it had to be funny."

The game has essentially three locations, the Winchester club where dealers, assorted low lifes and, on occasion, Mr Chisholm can be found, the lock up where the goods Arthur Daley buys and sells are kept and various dealer locations where yet more deals are made. "I decided against the car lot because all that could happen there was the buying and selling of cars and I thought that would become boring.

One thing that Don's specifications for the game meant was that the game should be populated by many 'characters', people who were always around adding atmosphere. Since the game also had to be graphically interesting, there was the question of how to show lots of different people who aren't simply featureless stick insects. "I wanted people's faces and then hit upon the idea of a sort of rogues gallery." In practice what this means is that when you go to the Winchester club you see an assortment of different faces like a series of wanted posters.

"The routine for drawing faces is set for the faces of specific people like Terry and the dealers, but can create randomly generated faces for other people." An important feature of the game is the 'real time' which means that different people will be found at different locations at different times.

The question ■ dialogue is a major



form ■ pseudo East End language which marks the series. For example, a dealer offered me a nice line in coats for about £80 each and Don invited me ■ haggle with him. I thought of the most non-standard, round about way of expressing the idea, something like 'cor, leave it out, squire, make it £48'.

To my amazement, the character came back with a better offer having understood my input.

The same thing works in reverse if you try to sell something - in a sense you bring the style of the TV program to the game. How does it work? It took me a while to figure it out and I'm not going to spoil it for you, but let's just say it doesn't require the most sophisticated language analysis routines known to mankind.

But what about Terry. In the program all he really gets to do is lug stuff you've bought and sold about and occasionally protect you for a small amount of money. Hadn't Don diminished Terry's role somewhat? "I watched the program over and over again and that's all Terry does. Arthur ■ always the leader, he's the entrepreneur. Terry only acts when Arthur has gone over the top or needs rescuing. He isn't really very motivated otherwise. The reason his role seems bigger is because of the way its acted, subtle looks and glances that make the program great, but are impossible to program."

As the game was developed, it has been changed here and there. "The main thing has been simplification; in earlier stages there were more complex haggling episodes; for example, you had to agree a price for Terry to work for you, now he always gets the same amount.

"I changed it simply because the game plays better; sophisticated isn't always more fun."

In terms of the way it reflects the TV program and playability, the finished game is better than anyone could have hoped for and being able ■ type in things like 'leave it out, squire' and not get 'I'm sorry I don't know what you mean' is bliss.

I'm out out to get a box of big cigars and a funny hat.









# TO ADVERTISE YOUR SERVICES IN THIS SECTION CALL; P.C.W. CLASSIFIED ON 01-437 4343.

## SPECTRUM REPAIRS

**Guaranteed six months**

Expertly repaired and thoroughly overhauled by professional computer engineers using only top grade components. Manufacturers recommended modifications are fitted and all units are fully guaranteed for six months

**£15.00 all inclusive**

Post or personal callers welcome. Upgrade to 48K £25.00

## MP ELECTRONICS

The Laurels, Wending, Dereham, Norfolk NR16 2LZ

Tel: 0362 87327

PL48

## HOME COMPUTER REPAIRS

Look at our fantastic prices on repairs

VIC 20	£30.00
Commodore 64	£27.00
Dragon 32	£35.00
ZX Microdrive	£17.25
ORIC 1/Atom	£26.00
ZX Interface I/O	£17.25
ZX Spectrum	£17.25

plus others  
Above prices are average for natural defects

All repairs carry 3 months' warranty on replaced parts

**SPECTRUM UPGRADE TO 48K £25.95**

Ring for full details: (0234) 313645

## ZEDEM COMPUTER LTD

2 Knebels Road, Bedford MK43 7JL

## HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service send your 16/48K Spectrum computer to us. We will repair and return for £20 + £1.60 p.p. Also BBC Commodore Atari and Dragon service

Hemel Computer Centre Ltd.

52 High Street,

Hemel Hempstead,

Herts HP1 3AF.

Tel: 0442 212438

## SINCLAIR COMPUTER REPAIRS

SPECTRUM £17.00

ZX SPECTRUM £18.50

For parts, p.p. and return insurance speed

turn and 48K for £25. At present we

cannot upgrade as we are like to take

care of your computer. Service charges only

by £1 and send with cheque or P.O. to

I.T. (WESTERN) ELECTRONICS

92 Watlington, Trowbridge.

Wils 0274 989

Tel: 0274 98974

PL54

## UTILITIES

USE VTX 5000 on Bulletin boards! 'Spectrum' program £5.95. Spectrum for any hardware RS232 board £5.95 (both full facilities, download, load, microdrive/tape, send control chrs) Stephen Adams, 1 Lisswin Road, London N16 7NL. Tel: 01-254 1869.

HACK'N is an easy to use utility designed to provide for adventures, works with both machine code and basic games. Send £10 (state tape or microdrive) Chris Stubbs, 395 Holham Road Priory Road, Hull North Humberside.

CBM64 divide memory into three 12K workspaces. Work area without disturbing others. Lister £1.00 - SAE David Miller, 38 Exeter Garden, Ilford Essex

## Computer Repair Centre

Have you got problems with your computer? Then call us for

Commodore, BBC,

Spectrum, Dragon



Mail order or call us

Kefield Communications

135 High Street, Ponders End, Middx

Tel: 01-805 7772

PL101

## Faulty Spectrum

Rancho-Mexico

a. We will repair your Spectrum correctly.

b. Test your Spectrum for 24 hours

c. If not any other hidden faults and repair

charges will be covered

Send us your Spectrum for £10.00

Rancho-Mexico, Dept. N4, Maryon Street,

Salford 7, Manchester M7 9DL

PACK ALLERS AT PREMIER

Tel: 061 792 2260

PL10

## REPAIRS

For all computers - TV games

Good rates

Insured delivery

Fast turnaround

Trust the people who know

Parts replacement despatch

## MERLIN GAMES

111 Dover Road, Deal, Kent

Telephone: 0304 341541

PL202

TO HIRE a computer from Spectrum 48K onwards, please phone or write to: Business & Computer Services, 294A Caledonian Road, London N1 1BA. Tel: 01-607 0157 or 01-897 8457

COMMODORE REPAIRS by Commodore approved engineers. Vic 20 Modulators £6.50. Vic 20 from £14.50. CBM64 etc. for more details write or tel: G. C. Bunce & Son, 50 Burlington Road, Burnham, Bucks SL1 7BQ. Tel: 06286 61686

## COMPUTER REPAIRS IN SOUTHERN

SPECTRUM, BBC, ELECTRON

COMM 40, VIC 20

MINIMICROELECTRONICS

12 Eastern Esplanade, Southampton

07036 62033/615009

Open 7 days a Week

PL11

## SPECTRUM REPAIRS

We expertly repair Spectrums for £17 inclusive of parts, labour and return postage. Spectrums upgraded to 48K for £34 including post.

R.A. ELECTRONICS,

133 London Road South, Lowestoft NR33 0QZ

Tel: (0502) 86289

PL46

## FAST SPECTRUM

& B.B.C. 'B' REPAIRS

FIRST COMPANY IN ALL U.K.

TO INTRODUCE WHILE-U-WAIT

SERVICE. NOW FIRST TO OFFER AN

INTERNATIONAL REPAIR SERVICE

ALL INCLUSIVE REPAIRS FROM £7.00!

- MOST SPECTRUM & BBC 'B' COMPUTERS REPAIRED IN 15 MINS.
- WE ALSO REPAIR APPLES, MONITORS, T.V.'S, POWER SUPPLIES, INTERFACES & MICRODRIVES
- 3 MONTHS GUARANTEE ON ALL REPAIRS
- PLEASE PHONE FOR APPOINTMENT FIRST.
- OR PHONE/SEND SPECTRUM/BBC FOR FREE ESTIMATES, ENCLOSING £1.80 (U.K. L.O.M. EIRE. C.I.) £6.50 (EUROPE/SCANDINAVIA) FOR RETURN POSTAGE. 061-224 1888
- NO HIDDEN HANDLING CHARGES.
- ALL REPAIRS TURNED AROUND IN 24 HOURS!
- EVERY MICRO INSURED FOR RETURN JOURNEY.
- NO DEALERS OR MIDDLEMEN.
- YOU ARE DEALING DIRECTLY WITH A TEAM OF PROFESSIONAL ENGINEERS
- 10 MINS FROM MANCHESTER OR STOCKPORT CENTRES
- OPEN SEVEN DAYS A WEEK TILL 7 P.M. (MON-SAT)

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP, and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and (more importantly) correct cures"

PHIL ROGERS 'PEEK & POKE'

"POPULAR COMPUTING WEEKLY" JAN. 1985 (VOL IV NO 1)

WE ALSO DESIGN A MANUFACTURE COMPUTER

HARDWARE & SOFTWARE ON A CONSULTANCY BASIS !!

**MANCOMP LTD.** (DEPT. PCW)

Printworks Lane, Manchester, M19 3JP.

061-224 1888

ENGINEERS ALSO WANTED

## COURSES

BUSINESS & COMPUTER SERVICES are also computer consultants, specialising in small (and very small) businesses. Write or phone us at 294A Caledonian Road, London N1 1BA. Tel: 01-607 0157

RESIDENTIAL COMPUTER COURSE Software/Hardware. Weekend/Weeks. For further details contact: Jaysoft Micro Developments, Blackadder Bank, Greenham, Berwickshire. Tel: 036 16458

RESIDENTIAL COMPUTER COURSE Software/Hardware. Weekend/Weeks. For further details contact: Jaysoft Micro Developments, Blackadder Bank, Greenham, Berwickshire. Tel: 036 16458

## LEARN TO USE COMPUTERS

17  
COMPUTER WORKSHOP

Details: 01-778 9080

PL112





**CASIO MT 70** Electronic keyboard - power supply head phones, light pen, sell for £170 or swap for Epson RX80/FX80 or similar printer. Tel: Shaw 0706-845418

**AMSTRAD CPC 464** system modular, books joystick cover, clubs basic tutor etc cost £400 - £500 software £298 (plus the lot). Local enquiries welcome Tel: 041-649 0037 after 6pm (Glasgow area)

**SINCLAIR ICL** screen pocket TV boxed with earphone and case only a month old. Battery unused quick sale hence the price or £59 trip £96 Tel: (Glasgow) 649 0037 after 5pm

**VEXTREX COMPUTER GAME** system, built in monitor screen & speaker, three joystick control panels, eight game cartridges & one built in game. Excellent condition £100 ono Tel: Herley 771878

**AMSTRAD** software originals Commodore MAT, Football Manager, Fruit Machine, Harrier Attack, Manic Miner, Roland & Games Steve Davis Snooker, Star Comander, £5 each, Tel: 0625 528039 after 6pm

**ZX PRINTER** £30. Hurg £5 Melbourne Draw £14. Abercrombie Forge £5. Fifth £5. Sherlock £8. Lords £14. Midnight £5. Tel: Jann Whiting 0245 354942

**QL COMPUTER** with microdrive 82M dot matrix printer, all loads manuals etc, large box of paper for printer and book on 68000 programming. Sell for £450. Tel: 0344 423878

**SINCLAIR QL** for sale - advanced user guide & assembler & utilities & negotiable. Contact Andy Falconer. Tel: 01 452 1275 after 9.00pm or Tel: 0970 4227 Between 1-2pm

**SHARP MZ-804** for sale with basic and manual. Open to cash offers or may swap for Hi-Fi. Will deliver 40 miles from Duxford. Tel: Frank on Oxford 775956

**EPSON TX80**, 120 CPS printer £120 ono. Tel: Ashbourne 70846 ovos

**SINCLAIR INTERFACE** two plus Flame-toids rom cartridge only two months old, vgc. Cost £35 will sell for £20 inc p&p. Tel: Leeds 524856

**ALIEN 8** original £7 (mint condition). Raid over Moscow. Supremat. Phelli 2, Witch's Cauldron. Atari Pacman. Brian Bloodaxe, Zaxxon, Match Day, Kung-Fu, T.K.V. Spiderman, Monty is Innocent. Tel: Paul 0532 630206 evenings

**100K BBC** disk drive as new £30 also silent computers, microdrive/monitor console cost £40. Bargain £15. Tel: Convey Island (0288) 682782

**FOR SALE** Spillere Aco by A.S. Gold for £5 many other items also for sale for the Commodore 64. Tel: 021-7775023 for Hewlett 45 Slonowood Ave. Hnt Green, Birmingham B26 0AX

**PB700** fully portable computer with in-built screen, 48k. Powerful basic, fast, complete with manuals, case, nicads etc. 1985 model, selling as I have two £100 + off UK price! £120 ono. Tel: 527 5493

**POPULAR COMPUTING WEEKLY** magazines 140 April 1987 to February 1984. Offers, buyer collects. Tel: Rugeley 5836

**FOR SALE:** Names and Addresses files program on Amstrad CPC 464. Access code (feature for confidential information £3.99). Tel: Cowers Lane 855 after 6 pm.

**PLAY DARTS?** A menu driven program for Spectrum (16148K) for Five Pub Favourites includes Life, Cricket, Shanghai etc and rules Send £2.00, A Bolsover, 256 Haslar Road South, Sheffield S13 8EJ

**MAGAZINES FOR SALE** S-User from Sept 1982 YC from June 1982 C & VG from Feb 1983 PCW from volume 1 No 15. All in vgc. Telephone Matthew after 6pm for details Tel: 050-770339

**HOME COMPUTER** course full set in binder £20 in exchange for Dragon Manual or Working ZX81 Tel: Peter, Antim 65345

**HAZELTIME 2000** Monitor and twin cassette drive £20, two electric typewriters, one working, needs attention, other S or R 215 each or £25 both. Tel: Co. Durham 801-466 after 4pm

**DK TRONICS** - light pen - Currah Speech All to fit Spectrum swap for interface 1 + Microdrive. Tel: Lowesloft 731932

## Wanted

**TANDY T1650** colour computer tape recorder 8 games, 2 joysticks books - leads 2 months old, £150 or swap for any computer. Tel: Leeds 055910

**DOES ANYBODY** own a 18k RAM pack for VIC 20 who wishes to sell for a small sum about £15. Tel: Knowin 6378 after 9pm

**WANTED** Atari 800 and bits and pieces. Cash waiting if the price is right. Tel: 06582 6107

**WANTED BBC 12** in exchange for dual beam oscilloscope smilli by SE lab's complete with two X1 X10 probe kits all in good working order. Tel: Leedstown 850 478 or 0738 850 478

**SWAP** Philips portable music centre stereo D85354 compo sound machine servo tape transport mains or batt. Cost £189 for Commodore 64 and C2N cassette recorder. Hi Kitem, 2 Lynde Close Harcliffe, Bristol BS13 9LF

**"READ THIS"** will swap T159 programmable calculator with card reader, master & leisure libraries + Atari VCS, combat packman pooyan for Spectrum 48K or sell separately Tel: 05550 822509 after 4.30pm

**SWAP ACORN** Electron, manuals, magazines, leads and £700 of software for Commodore 64 and software 25 Oxwich Road, Mochdre, Colwyn Bay, Gwynedd. COMPUTER wanted prefer Atmos or ZX81 (broken) - must be cheap. Tel: 091 4823584 (ask for John).

**WANTED** Atari disc drive. Also XL 1. Good price paid for the right machine. Tel: 0526 21187 after 6pm please

**SWAP** Atari 600XL plus data recorder and software for an Acorn Electron. No software needed. Write to: Stephen Chaffwood, 31 Birchall Green, Woodley, Stockport, Cheshire, SK5 1RZ or tel: 061 494-0633

**SWAP** Spectrum 48K Alpha Com 32 printer, cassette recorder, plus quality s/w worth £150 plus Texas T199/4A computer. All perfect for Amstrad CPC464. BBC II or any other offers Tel: 01-643 2310

**SWAP** ZX Spectrum Plus Turbo Interface + many games for Atari 800XL or sell £135 Tel: Notts 844 390

**SWAP** 48K Spectrum - Prolog Interface joystick carrying case - £70 worth of games for C64. Sharp with VDU or good keyboard. Tel: Merseyside 051-678 2074

**WANTED:** Acorn Atom Disk Controller, drive etc. Also looking for software W. Gersner. Ahweg RD-5305 Atari West Germany

**ATARI** text graphic adventures wanted. Scott Adams Saga 3 to 12. Sand of Egypt: Dark Crystal etc in good condition with full instructions. Reasonable prices. Tel: 0763 420016 anytime

**ZX PRINTER** Alphacom 32 wanted urgently for ZX81 must include paper, will pay up to £20. Tel: 01-858 7420 after 5pm

**WANTED** computer and video games magazine Pro February 1983 will pay. Contact V Moore, 6 Baddeley House, Chastells Lane, Gloucester GL2 9HW

**WANTED** Amstrad CPC464 with or without monitor in exchange for Acorn Electron plus software (ex cond including nine months guarantee) and 10K ZX81 software + 8 channel I/O board. Tel: Lichfield 55241

**WANTED** for Spectrum HURG the Quill. Blat Compiler and The Prince microdrive utility must be originals with instructions will exchange in purchase at reasonable price. Tel: titraomba 66032 evenings Dave

**WANTED:** ZX81 with "Fuller" keyboard or similar. £30. Wantold Spectrum 48K, £50. Tel: Cirencester 0285 4858

**WANTED** disk drive for CBM64. I will pay around £90. Accessories not necessary but would help. Please Tel: 021-777 5023 ovos Dave

**WANTED** software or hardware for the Lynx 48K also for sale T1650 Speech Synthesizer and software, write to: Eddie, 12 Wellway, Sunnyside, Rotherham, South Yorkshire S66 0XX

**I WILL** pay cash for your broken Commodore 64 (preferably with casing in good condition) as I need one desperately for spares. Tel: 01-552 4283 Mark

**WANTED** T199ER magazines also American home computer magazines T199/4A extended basic wanted. Thorpe, 32 Glenesh Park, Dunsurry, Belfast BT17 9BA. Tel: 0232 623001

**SWAP** Marlin ADC unit DAC unit (proportionate) joystick in good working order for interface one and microdrive or wall-drive. Tel: Hanel (0843) 68522 after 6pm

**SWAP** complete radio control Tamiya Pajero car outfit, ballrace float + acorns radio electronic speed controller fast & slow chargers, 2x7 2v nicads costs £180 - Swap for good dot matrix printer + Spectrum interface Tel: 061 945 3688

## Spectrum for Sale

**SPECTRUM OWNERS!** People hacking into your programmes? Send for my protection program. Your own personal password. Send Cheque/PO £150 and S.A.E. to S. Tibbity, Nineteen Cetus Crescent, Leighton Buzzard, Beds, LU7 8NL

**OVER £300** of Spectrum software for sale. Including games like The Hobbit and Sherlock also Books and Magazines all in excellent condition selling for £110. Tel: Oxted, 653 7317

**SPECTRUM SOFTWARE** 150 games + originals for sale - all recent. Phone: Richard 01-699 7093

**SINCLAIR PRINTER** + 4 roll paper £24 ono. Fox programmable joystick, U/I joystick £20. DK Tronics Lightpen (can be seen working). Tel: 01-520 0563

**48K SPECTRUM** tape recorder, 11 original cassettes, books of listings - mags. Good condition. Will post anywhere £130 the lot. Tel: 0241 74691

**SPECTRUM GAMES** ZX printer paper. E.g. Everyone's a Wally, Alan & more. Sold separately. Tel: Radlett 2673 after 3pm

**SPECTRUM GAMES**, E.g. Bealey and the Egg Snatchers, £4.95. BMX Motors 1, Pole Position £5.95 etc. Tel: Radlett 2673

**SPECTRUM S/W** £120 worth for £80. Tel: 01-2441 0370 (Atk)

**SPECTRUM 48K** interface II, data recorder, over £800 of software, sell for £270 or offers. Tel: (0989) 60038 Ask for Colin after 5.30pm

**VTX5000** model for the Spectrum £50. Also over £500 of original software £200. Will not split. Tel: North: 750 952 and ask for Andrew also some Dragon books

**SPECTRUM** software Chess, Blue Thunder, Scramble, Formula One, Chequered Flag, Password 2, Make a Chip 5 all for £30. Tel: Norwich 418044

**CHEMISTRY AND PHYSICS** software by Inter Research for the Spectrum 48k have used them revision. Chemistry £3.50. Physics formulae £5.50. Phone: 0225 332163 after 8pm ask for Drew

**SPECTRUM** software originals! Eddie Kidd's Adastria, Tumble Trouble, Factory Breakout, Dimension Destructor, Eskimo Eddie all £3 each also Full Thriller, The Quill, Pyromaniacs. Offers? Sell all cheap in bulk. Tel: 01-999 7013

## Commodores for Sale

**COMMODORE 64** in perfect condition + cassette £145 ono. Tel: Martin 0202 874066

**COMMODORE C2N** data/cassette unit plus unused blank tapes only £15. Will send by post at no extra charge if required. Phone: Medway (0634) 12749 evenings

**CBM III** disk based business software worth over £600 for sale (£150) or swap for equivalent value software. Kevin Vordvik, Kronstadtdalen 44, 5000 Bergen Norway

**CBM 1520** Colour printer/plotter v.g.c. £60. Tel: Essex 83055

**COMMODORE 64** - printer, b/w monitor + tape recorder computer desk + approx £250 worth of s/w + joysticks £475 ono (inc various mags). Tel: 01-870 1871 (evening only) ask for Tony

**BBC 601** Commodore printer for sale 5 months old including spare ribbon and some paper £150 ono. Tel: 01-446 3281

**CBM 64** all original summer games, Hi-Fi, Strike Eagle, Cad-Cam Warrior etc. Tel: 061-978 8354

**CBM VIC 20** + £800 worth of accessories £90 on may apply. Tel: 061-643 3865

**CBM 64** 1541 Drive DPS 1101 Printer 1701 Monitor, C2N Data Set, Startlight Joystick, CBM Modern Koolas Road Touch Tablet + Koala Printer s/w, loads of boards offers or swap for BBC and Peripherals. Tel: 0258 56845

**CBM 64/Vic20** Seikosa printer 12 months old £110 ono. Also CBM 64 pastel modern £70. Consider Swap for BBC disc drive or Acorn Music 500. Tel: 0744 895150

**CBM 64** software for sale, for sale, T22 £4. Daley Thompson Decathlon £4 also a box of 10 Double sided/Double density Discs-unused £13.50. Tel: 0670 828430

# BLACKHEATH GALLERY 34A TRANQUIL VALE LONDON SE3

APRIL 1985

An exhibition of The  
Science Fiction Paintings of  
Ian Craig Richard Dunn Stuart Hughes



**CBM 64** original games. Suicide Express, Archipel, Flak, £4 each. BCS Quest, Spynhler, Blue Max, Quo Vadis, Staff of Karnath, Boulder Dash, £5 each. Bruffo Leo, Stellar 7, £6 each. Also many more cheaper. Tel: (0323) 891871

**CBM** software to sell (or will consider exchange) many titles available in: Pispot 7, Staff 7, Karnath, Lords of Midnight, etc. Write to Steve, 45 Walfgate Road, Chirwell, Liverpool 25. **VIC 20** C2N Intro Basic, Pirate Cove Adventure, Sargon, Chess Reader, Ralrace, Fort Knox, Omega Race, all cartridge. Other games £130. Ring 01-676 3293.

**5 PIECES** CBM 64 software (originals) sell for £16.50 (less than 1/2 price). Tel: Brimley Hill 263906 (jovus).

**CBM 64** Selling and swapping (original) disk software. Tel: 01-571 2870 (after 4.30).

**CBM 64** C2N, games cartridges, 4 cassette boxes £110. Tel: 09544 733.

**CBM 64** tape deck + turbo basic extend + light pen - s/w. Forbidden Forest, Stunt bike, etc. £28. Tel: 01-274 9010 (after 8.30pm).

**CBM 801** printer + paper £145 o.n.o. Tel: 01-689 5581 01 404 5651 (day).

**VIC 20** comms package. VIC 20 Dacom Buzz Box Modem, Terminal software, cassette recorder, few games, RS232C Interface. Only £115 o.n.o. Tel: 068 4044 or write 173 Hampden Way, Southgate, London N14.

**ORIGINAL** Commodore 64 games software for sale £2 each two or more £2.50 each. Updating my library send for list. D J Brown, 104 Gildard Road, Stockwood, Bristol BS14 8TU. Tel: (0272) 638333.

**CBM 64** £120. Disk drive £140. C2N recorder £20. Easyline £25. Flight Simulator £20. Mikro Assembler £25. SimuBasic £25. All together £350. All v.g.c. Boxed. Tel: Brinknoll 56366 evenings.

**COMMODORE 64** £541 disk drive, C2N cassette, tv/hw/extension games (loads) easy script database assembler books etc. £395. Tel: Dave 0442 43258 after 6pm.

**CBM 64-CM2** tape recorder £120 of s/w, Quick Shot, joystick all with boxes. mini collection £200. Tel: 01 393 4873 Epsom.

**CMS 64**, Frank Suicide Express, Zaxxon, Jammin' exchange for Chuckie Egg, Rard over Moscow, Pole Position, Boulderdash, Tel: Southampton (0703) 847168.

**CBM** software for sale. Spy vs Spy, Castle of Terror, Return to Eden, Spiderman 5, Heroes and Empire of Karn, Football Manager, Ten Little Indians £3. Tel: Epsom 41910 evenings.

**VIC-20** computer C2N cassette unit, 16k switchable RAM pack, joystick, lots of software, Sell for £110 o.n.o. Tel: 01 696 9321 after 5pm.

**VIC-20** + lots of mags + introduction to basic £40 o.n.o. Tel: Sheffield 695447.

**CBM 1541** disk drive with easy script + 5 Infocom adventures + 10 games disc. Offers. Tel: 031 561 3411 before 8pm.

**CBM** + 1541 disk drive + free games, disc. boxed as new. £250 o.n.o. Tel: 01 590 9990.

**COMMODORE 6016** with toolkit. Extramex in Rom, sound and software £120 o.n.o. Tel: Nottingham 633295.

**UNEXPANDED** VIC-20 game, Stuntman, Barney Guido, Barney through three different stages, features, Hi-score table, joystick. Send only £2 and stamped a.s.e. to Darren Booth, 11 Cornfield Garth, P/Lea, Co Durham.

**FOR SALE** Cuddley Cuthbert and China Miner from Interceptor micros for your Commodore 64 for £3.50 each. Tel: Dave 021 7775023. 45 Stonewood Ave. Hall Green, Birmingham B28 0AX.

**VIC-20** C2N cassette recorder, 16k switchable Ram pack. Quickshot, joystick. Introduction to Basic £100 of s/w £80. Tel: 01-461 1870.

**CBM 64**, large Satellite, well known original games £4 each or get four - one free. Tel: 01-456 2955 after 5pm.

**CBM 64** inc manual books. s/w £150. Tel: 0634 407056.

**ORIGINAL GAMES**, check out these prices, Vic-20 prog. Arcadia £1.50, Wacky Wangers £2, Fatty Henry £2.50, Wiz and Princess £2, Aussi Xeno II (16k) £1. Trea cheap, Tel: M.J. 0558 622509.

**VIC-20** £45, C2N £18, Commodore joy stick £3.50. All in very good condition. Tel: Farnborough Kent 56634.

**COMMODORE MPS801** Dot-matrix printer as new £125. Habtarea 9in hires green monitor £55. Texas 1199/4A computer + software + books £35, Easy script £25, Easy stock £25, Future finance £25. Tel: Hemel Hempstead 211323 evenings.

## Dragon

**DRAGON 32** £80 or s/w. 2 Joysticks, Swap 48k Spectrum + interface or sell £120. Tel: Leicester 38328 G Primer.

**DRAGON** s/w £75 worth for £25, 12 original games. Tel: Ivor 654445 eyes.

**DRAGON 32** for sale boxed with all leads and manual. Buyer collects £50. Also Please Telephone 01-639 8545 from 8pm except weekends.

**DRAGON 32**, boxed + joystick cassette recorder. original software worth £140 (Kriegspiel Legit, Chess etc). Programming books + lots magazines. For quick sale £120 the lot. Tel: (021) 426 4888.

**DRAGON 32** 3 games Ram cassette recorder offers. Tel: 06544/33.

**DRAGON 32**, boxed + joystick cassette recorder. original software worth £140 (Daland, Donkey Kong, Chess, etc). 4 Programming books + over 80 magazines. Bargain at £120. Tel: (021) 426 4888.

**Dragon 32K** plus software books, etc. £75 one or will swap for anything Atari or Spectrum etc. printers or microdrives. Phone B'ham (021) 747 3618 after 6pm.

**FOR SALE:** Dragon 32 games 25, all originals, Microdeal, Salamander, etc. £55. May split. Phone Paul on 0698 285586 after 4.30 pm. Also one broken Dragon 32 computer £70.

**DRAGON 32** computer recorder, joysticks, Seikosha GP100A printer, Books and magazines £800 + software. Take £300 for the lot. Would split or exchange for best Spectrum or Atari offered. Telephone 0433 20304.

**DRAGON** software - Mr. Big, Backtrack, Dasm/Demon rom, Puocrawl, Chuckie Egg, Golf, Grabber, SAS Ossie, D.A.G.G. 747 Flight Free Parking, Glaxions, Frogger, Defense, Cuthbert's, Storm, Blothead, Cricket - others. Tel: (0274) 583734.

## Acorn for Sale

**ACORN DFS** kit 0.90 £80.50 CMOS ram 6116-1P3 low power £2.75 each. light pen and software for pen £12 free. VIC-CALC with pen. Tel: Mr Vekaria 01-202 6410 after 6pm.

**BBC MODEL B** 1.2 o/s Complete with connecting leads, user manual. Acorn joysticks, lots of games software, blank cassettes and computer magazines £275. Tel: Chelmsford 6245 50432.

**LOOK!** BBC software for sale. Oblivion, Swoop £5 each. Also Asp Model B Computing (on cassette) £2.50 also BBC games book £150. Tel: Simon Barnstey 762349.

**ACORN ELECTRON** - s/w (original games) £730. Tel: 01-731 6694 (Brian).

**BBC B** etc. 800K dual disk drive 16k sideways Ram, cartridge slot, nearly 70 roms (wordwide, view etc) - over £1,000 worth of software only £850. Tel: 05027 69152.

**MASSIVE BBC** software for sale. 25 originals worth £180 sell all for £80 or will split titles include Sabre Wilt, 3D Grand Prix, White Knight, MK 12, Fortress. Tel: (0629) 51076.

**BBC 100K TEAC** 5 1/4" disc drive with own PSU + utility disc etc and leads £80. Also Aries-620 ram board (unused) £50. Tel: 01-942 9661 ex227 (daytime only).

**BBC MICRO** software and peripherals, including disks, BBC Buggy, Quest etc. Most under half price and in good condition. Bookham 53694 ask for Mr R Boynton or Mrs A Dornier. 95 only.

**BBC SOFTWARE** for sale. Castle of Riddles, Canyon Monsters, Facemaker, Number Guesser and Missing Signs. All originals rrp £10 each sell for £4 each. Tel: 0486 683786 4.30 on weekdays.

# THE FUZION OF MIND AND MACHINE CONFUZION

## ADVENTURE

## HELPLINE

**Hampton on CBM 64**, I have 90%, meaning I have got the car, Pippa, cottage, visited Lord Chubby Fish. Where is the final 10%? Help! Paul Gorrard, 4 Tennyson Gdns, Fareham, Hants.

**The Planet of Death on Spectrum 48K**, How do you get the spaceship to take off once you are in the hanger? Nigel Clarkoon, 49 St. Budes Close, Crossgate Moor, Durham.

**Genus of stardus on Amstrad CPC 464**, How do I get across the pool and pit, and where is the matchbox? James Cumming, 72 Culbin Drive, Knightwood, Glasgow.

**Valkyrie 17 on Spectrum 48K**, I can't get past the border guard and into Carpathia, but can help fellow adventurers stuck further back. David Thomas, 38 Queen's Road, Jermiston, Newcastle-upon-Tyne.

**Eureka on Spectrum 48K**, How do I get past the Brachiosaurus in the pre-historic age. Please! White, 12 Crossways, Camphill, Newport, Isle of Wight.

**Eureka on Spectrum**, How do I get past the brachiosaurus in pre-historic times? Dean Brown, 89 Hinchin Close, Harold Hill, Romford, Essex RM3 7EG.

**Jewels of Babylon on Amstrad**, How do I get from the beach area? Or what significance is the boulder? Dominic Frost, 28 Badgers Croft, Eccleshall, Staffs ST21 6DS (Eccleshall 890 286).

**Return to Eden on Spectrum**, How do you avoid being burnt at the start - I have gone down the molehill? Peter Craven, 81 Suman Avenue, Blargownie, Randburg 2194, Transvaal, South Africa.

**Altair 4 on Commodore 64**, Can anyone help please! P G Hall, 6 Stratton Road, Stanford-le-Hope, Essex 5617 0N2.

**Jewels of Babylon on Amstrad**, How do I get past the cannibals village? Philip Lewis, 68 Whitwands Road, High Wycombe, Bucks HP12 3EL.

**The Hulk and Spiderman on Spectrum**, Have done 64% of the Hulk - where do I find any enemies? Have done 56% of Spiderman - how do I get past the fan? David Rivett, 40 Clouston Street, North Kelvinside, Glasgow G20 6QL.

**Ship of Doom on Spectrum**, How do you get the body from the ice and how do you get the key from the case? Mike Bishop, Flat B10, Llys Tal-Y-Bont Halls, Mandy, Cardiff, Wales.

**Adventureland on Vic20**, How do you get the fish from the lake without them dying? How do you find the medicine? Richard Wallace, 30 Rowena Avenue, Edenthorpe, Doncaster, S Yorks.

**Dungeon Adventure on Commodore 64**, How do you get past the giant rat and how do you get permanent light source? D K Hawthorn, 3 Hanger Road, Tadley, Basingstoke, Hants RG28 8QQ.

**Urgan Uptart on Spectrum**, Help please! I've got to the plane, I've even managed to take off, but I always crash! Why is this the way out? John Cook, 55 Wickenby Crescent, Lincoln LN1 3TE.

**Mountains of Ket on Spectrum**, How do you pick up the dice and the false beard? Stuart Walsh, 6 Laincock Jackman Estate, Leitchworth, Herts, SG6 2PU.

**Spiderman on Commodore 64**, How do you make web fluid? Please help! Aaron Trinder, 63 Gascony Avenue, London NW6 4ND.

**The Pen and the Dark on BBC**, How do I buy items? How do I open the door which requires the card? How do I get the vehicle, cable etc? Fraser Smart, Travellers, Largo Road, Leven, Fife, Scotland.

**Lords of Time on BBC**, How do you stay warm on level 2? How do you get the jumble of wood? How do you get past the manmouth? Carl Bessley, Badgers Croft, Eccleshall, Staffs.

**Twin Kingdom Valley on Commodore 64**, After you have come out of the castle and the drawbridge goes up, what next? Stephen Tipling, 121 Church Road, Worle, Weston-super-Mare Avon.

**Lords of Time on Spectrum**, Where do you find the gold nugget and the fine sharp sword? Graham Everlas, 14 Springfield Avenue, Cheshierfield, Derbyshire.

**Jewels of Babylon on Amstrad**, How do I get past the cannibal's village and what do I do with the lion? R W Sandham, 14 Edwalton Court, Mansfield, Notts.

**Adventure Quest on Commodore 64**, I am The Swan and I can't get to the black lower. Graham Shiwell, 72 Mill Road, Havertill, Suffolk.

**Ship of Doom on Commodore 64**, I can't get the key from under the cover. I'm completely stuck. E E O'Brian, 2 Bridge Path, Madocly, Nr. Crewes, Cheshire.

**Secret Mission on Atari**, I have mapped out ten rooms but I can't find the keys for the buttons on the chair. What is 'sufficient authorization'? Russell Hubner, Selwyn, Lower Sishon Road, Hendford, West Sussex.

**Lords of Time on Amstrad**, How do I change time zones? What do I do with the red porche? How do I get the coin from the looth fairy? Please help. A J Ashwood, c/o Au Traffic Control, RAF Gatwick, BPO 47.

**Twin Kingdom Valley on Commodore 64**, What do I do when I have 1024 points? Darren Owen, 52 Partridge Close, Chemsley Wood, Birmingham.

**Korea of Karn on Spectrum**, Where do I find Khadim? How do I get the wand? J Smith, 43a Currier Street, Selkirk, Selkirkshire, Scotland.

**Inferno on Spectrum**, What signal is needed? R Walls, 1 Daffodil Avenue, Brentwood, Essex.

**Tower of Dispair on Spectrum**, How do I get through the 'deshty' door on the shifing plain? How do I get past the angel of death? J C Smith, 43a Currier Street, Selkirk, Selkirkshire.



- Vic 20**
- (1) Wizard and Princess (Mel House)
  - (2) Mickey the Brickie (Firebirds)
  - (3) Doodlebug (Mastertronic)
  - (4) Psycho Shopper (Mastertronic)
  - (5) Phantom Attack (Mastertronic)
  - (6) 3-D Maze (Mastertronic)
  - (7) Vegas Jackpot (Mastertronic)
  - (8) Neuron Zapper (Mastertronic)
  - (9) Snake Bite (Firebirds)
  - (10) New York Bus (Mastertronic)
- (Compiled by Webster Software)

- Commodore 64**
- (1) Booby (Firebirds)
  - (2) Chiller (Mastertronic)
  - (3) Mitrone Triple Pack (Mastertronic)
  - (4) (10) Azimuth Head Alignment Tape (Interceptor Micros)
  - (5) Mega-Hits (Beau Jolly)
  - (6) 1985 (Mastertronic)
  - (7) Ghostbusters (Activision)
  - (8) Bug Mac Mad Maintenance Man (Mastertronic)
  - (9) Dancin' Mouse in Double Trouble (Thorn EMI)
- (Compiled by Webster Software)

- Spectrum**
- (1) (8) Everyone's a Wally (Microgen)
  - (2) Mitrone Triple Pack (Mastertronic)
  - (3) Wizards Lair (Bubble Bus)
  - (4) Moon Cresta (Incentive)
  - (5) Booby (Firebirds)
  - (6) Pandora's Kite (Mastertronic)
  - (7) Pele Position (Atari)
  - (8) Bruce Lee (US Gold)
  - (9) Raid Over Moscow (US Gold)
  - (10) Mega-Hits (Beau Jolly)
- (Compiled by Webster Software)

- BBC B**
- (1) Football Manager (Addictive)
  - (2) Scribble (Leisure Genius)
  - (3) Spectrope (Mastertronic)
  - (4) Duck (Firebirds)
  - (5) Casals Quest (Microgen)
  - (6) Star Maze (Mastertronic)
  - (7) Manic Miner (Software Projects)
  - (8) Utron (CSM)
  - (9) White Knight Mk II (BBC Publications)
  - (10) Acid Drops (Firebirds)
- (Compiled by Webster Software)

- ATARI**
- (1) (2) Compilation Tape I (English)
  - (2) Computer War (Atari)
  - (3) Sub Commander (Thorn EMI)
  - (4) F16 Strike Eagle (Centrosat)
  - (5) Colossus Chase (English)
  - (6) Encounter (Hi-Tech)
  - (7) Attack of Mutant Camels (Idamast)
  - (8) O'Reillys Menu (Centrosat)
  - (9) Crisminner (Idamast)
  - (10) Donkey Kang (Atari)
- (Compiled by Webster Software)

- C16**
- (1) Games Tape 3 (Melbourne House)
  - (2) Roller Eon (Melbourne House)
  - (3) Games Tape 1 (Melbourne House)
  - (4) Stellar War/Blitz (CBM)
  - (5) Berks (CBM)
  - (6) Crazy Golf (CBM)
  - (7) Vegas Jackpot (Melbourne House)
  - (8) Williamsburg Adv (Microgen)
  - (9) Flight 015 (Craig Communications)
  - (10) Spiderman (Adventure International)
- (Compiled by Webster Software)

- Amstrad**
- (1) Sorcery (Virgin)
  - (2) Mutant Man (Amstrad)
  - (3) Fighter Pilot (Digital Intervision)
  - (4) Grand Prix Driver (Amstrad)
  - (5) Pitman Typing (Amstrad)
  - (6) Flight Path 737 (Amstrad)
  - (7) Mini Office (Database Publications)
  - (8) Code Name Malt (Amstrad)
  - (9) Hunchback (Ocean)
  - (10) Classic Adventures (Amstrad)
  - (11) Dark Star (Design)
- (Compiled by Webster Software)

Event	Date	Venue	Admission	Organiser
<b>Northen Computer Show</b>	April 18-19 10.00am-6.00pm	Bella Vue Manchester	Free in advance from organisers	Reed Exhibitions 01-543 8040
<b>Apple II</b>	May 8-10 10.00am-8.00pm May 11 10.00am-4.00pm	Novotel London W9	Free in advance from organisers	Database Publications 091-458 8383
<b>Electron &amp; BBC Micro Year Show</b>	May 9-11 10.00am-6.00pm May 12 10.00am-4.00pm	New Horncumral Halls London SW1	13.00 adults 62.00 children	Database Publications 061-458 8383
<b>London Festival of Computing</b>	April 9-20	Various Contact organisers	Various Contact organisers	London Festival of Computing 01 240 8208
<b>Communication Aids for the Handicapped International Conference 85</b>	April 17-19	Sheffield Polytechnic College	Residential £98 Half-day session: £5	L. Hudson 0745 665274

## Readers' Chart No 19

- |    |     |   |                   |
|----|-----|---|-------------------|
| 1  | (3) | Alien 8 (Spectrum)  | Ultimate          |
| 2  | (1) | Knight Lore (Spectrum/C64)  | Ultimate          |
| 3  | (4) | Ghostbusters (Spectrum/C64)   | Activision        |
| 4  | (-) | Everyone's a Wally (Spectrum/C64)   | Mikro-Gen         |
| 5  | (-) | Bruce Lee (Spectrum/C64)  | US Gold           |
| 6  | (-) | Manic Miner (Spectrum/C64/Amstrad/MSX/Dragon/)                            | Software Projects |
|    |     |   | Virgin            |
| 7  | (-) | Sorcery (C64/Amstrad)   | Various Artists   |
| 8  | (2) | Soft Aid (Spectrum/C64)   | Various Artists   |
| 9  | (6) | Football Manager (Spectrum/C64/BBC/Electron/Oric/Atmos/Dragon/Vic20/ZX81) | Addictive Games   |
| 10 | (-) | Technician Ted (Spectrum)   | Hewson            |

Winning phrase No 19: "8 strikes lost in sleet" from Justine Freeman, Rothwell, Leeds, who receives £25. Other contenders who narrowly missed include "Look, the guests are singing" from S. MacGowan of Kendal and "His alien's got 8 toes" from Jason Cooper, New Malden, Surrey.

## Now voting on week 21 - £25 to win

Each week *Popular* is compiling its own special software top ten chart - compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever - but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan - but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 21 closes at 2pm on Wednesday April 17 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

**Name** ..... **My top 3: Voting Week 20**

**Address** ..... **1** .....

..... **2** .....

..... **3** .....

**My phrase is:** .....

# New Releases

## DIFFERENT

What do you get if you cross *Mastermind* with *Ehte*, and add a dash of *The Times* crossword? Not, as you might expect, "Icelandic inquisitor strikes upon smoky exclamation", but the newest Spectrum release from Melbourne House, **STARION**.

David Webb, author of two Melbourne House books and latest in the line of Oxbridge programmers, has produced a game combining what are possibly the best shoot-'em-up line graphics in the business with, of all things, anagrams and history. "You are, sir, a brave man," I say, as I'm not convinced that these bedfellows lie particularly well together.

The scenario is that 'the aliens' have been messing about with history - altering historical facts. Your task is to warp from time-zone to time-zone zapping enemy craft (in a very smooth scrolling and engaging manner), collecting their cargo of letters. Each time zone has a different ana-

gram to solve, which is the answer to a particular historical question within the time-grid you are in (an arrangement of 3x3 time zones). In essence, you go on solving various anagrams and questions over 243 time zones.

Technically brilliant, this game might not be a winner, but it's certainly different.

**Program** Starion  
**Price** £7.95  
**Micro** Spectrum 48K  
**Supplier** Melbourne House  
Castle Yard House  
Castle Yard  
Richmond  
TW10 6TF

## MEDIOCRE

There was a time when Amstrad owners were justifiably worried about software support for their new machine, but with programs of the quality of *Masterfile* and *Sorcery* turning up I would say that time is now officially over. Of course, together with the supremely excellent comes... the supremely average, and *Gauntlet* (together with *Killer Gorilla* on Side B) falls very solidly into the latter category.

Both have been previously released by Micropower for Acorn micros, and because the CPC 464 uses the same graphics chip (the 6843) they have 'reproduced the outstanding graphics almost exactly'. Outstanding? Two years ago on an inferior machine maybe. Today, no.

What you get for your £9.95 are two arcade clones - *Donkey Kong* and *Defender* - that aren't actively bad (although the true graphic capabilities

of the machine aren't touched), but just plain mediocre.



Arcade fanatics can get better elsewhere. Alligata's *Defend or Die* for instance - so the only market for this package is the 'serious' programmer that wants some occasional light relief at a cheap(ish) price. Not recommended for seasoned campaigners though.

**Program** Gauntlet  
**Price** £9.95  
**Micro** Amstrad CPC 464  
**Supplier** Micropower  
Northwood House  
North Street  
Leeds LS7 2AA

## FLOPPY BUDGET

There's this continuing problem with Einstein Software - whilst there is quite a bit about it's all very expensive. This is because you have to buy everything on 3½" floppies.

On the other hand having things on disc does tend to make all those home accounting packages a little more

easy to use, almost useful in fact. A case in point is *Home Budget* from Kuma.

The idea is that you create a database of monthly incomes and outgoings accounts to preset or self defined headings. These can be updated every month and results displayed as monthly and yearly totals or as bar charts.

The idea is that all this will help you plan your financial life and generally become a more financially stable person. Previous taped-based versions of this and similar programs were, to my mind, rendered useless by the cumbersome process of loading the things from tape. It just wasn't worth the bother, unless you were incredibly well disciplined, in which case you probably kept written records anyway.



On disc, loading in a couple of seconds, it will become feasible, you might actually use the program as it is intended. I have to say that, personally, I still don't even fill in my cheque stubs.

**Program** Home Budget  
**Price** £19.95  
**Micro** Einstein  
**Supplier** Tatung UK  
Stafford Park 10  
Telford  
TF3 3AB



## This Week

Program	Type	Micro	Price	Supplier	Ultima III	Ad	Commodore 64	£9.95	US Gold
Black Phoenix	Ad	Amstrad	£2.95	James Paton	Bounty Bob	Arc	Commodore 64	£9.95	US Gold
The Tomb of Kuzlak	Ad	Amstrad	£2.95	Intrigue	Conan	Arc	Commodore 64	£9.95	US Gold
Jelboot Jack	Arc	Amstrad	£8.95	English	Grogs Revenge	Arc	Commodore 64	£9.95	US Gold
Confuzion	S	Amstrad	£6.95	Incentive	Quasimodo	Arc	Commodore 64	£9.95	US Gold
Fishing	S	Amstrad	£7.50	Illusions	Super Pipeline II	Arc	Commodore 64	£8.90	US Gold
Artwork	Ut	Amstrad	£9.95	Kuma	Confuzion	S	Commodore 64	£6.95	Incentive
Wizardore	Arc	BBC B	£7.95	Imagine	Stringer	S	Commodore 64	£6.95	Addictive Games
Confuzion	S	BBC B	£8.95	Incentive	Super Huey	S	Commodore 64	£8.95	Audiogenic
Doughboy	Ad	Commodore 64	£9.95	US Gold					



# New Releases

## STUNNED

This is the first Imagine game I have seen which I've liked.

Admittedly, I haven't had much to go on, as I can't really get beyond the first screen, but what I've seen so far I enjoy.

It's a bit like *Castle Quest*, I guess, with a little sprite wandering about the screen, trying to avoid hobgoblins, archers and large birds that defecate all over you. (Actually, it sounds a lot like life, too.)

You can pick up various objects en route (at least I think you can - I haven't lived that long.)



The graphics are excellent, and very colourful - although I can't work out why you, "the last in the great line of ARCH MAGES", wear your underpants outside your trousers.

Movement is cursor keys for left and right, A for up/jump and Z for down, and delete for pick up/drop. Not too easy without a lot of practice.

Imagine claim "superb

graphics" and "amazing animation" which are both fair enough - but they also say "stunning sound".

It didn't exactly stun me - merely drove me mad, as every time you start a new game (in my case, frequently) the Beeb plays a dreadful little ditty which soon becomes unbearable.

An added attraction for potential purchasers is a competition - every month up to August 31, 1985, you can win £100 by sending in the competition entry form with the - wait for it - secret code which can only be got by completing the game.

Wow, that's... £500! Cheap way to deter piracy I suppose.

All in all it looks like a goody from Imagine. I was... well... killed a lot.

**Program** Wizardore

**Price** £7.95

**Micro** BBC B

**Supplier** Imagine Software  
(1984) Ltd  
11 Central Street  
Manchester  
M2 5NS

## HUMOUR

English Software had a lot of success with the various versions of *Jetboot Jack* and has adapted the game for that young pretender, the Amstrad 484. The game has been around for such a long time (by software industry standards) that it looks a bit old-fashioned now, but as platform and ladders, dodge and collect games go it is one of the best.

The idea is that *Jetboot Jack* has to move around the

record-pressing plant, which has a curious high number of platforms and ladders, to collect notes and dodge bugs and gremlins. The use of jetboots means, you might note, that Mr Jetboot doesn't have to have animated legs - he just skims about.



Anyway you collect notes, duck overhanging rocks and little spider things, work out how to use the various elevators and go on screen after screen, each one with a different screen layout. There are ten screens in all, which is peanuts by today's standards, but there's good humour and quality of design about the game that makes it pretty good. Technically unexciting, but you could do worse.

**Program** Jetboot Jack

**Price** £8.95

**Micro** Amstrad

**Supplier** English Software  
1 North Parade  
Parsonage  
Gardens  
Manchester  
M60 1BX

## CHECKMATE

What can you say about *Grand Master* that hasn't been said before? How about, it's now available for the C16? Well, it is.

The screen display is large and simple. Perhaps even a bit boring, but then you can't get the sort of graphics Paion dragged out of the QL on the C16, can you?

Movement is by algebraic notation, and the response to input is very fast.

There are ten different levels of difficulty, ranging from 1 (the computer responds within five seconds) to 9 (you may have to wait two hours). The tenth level is 0, where response is put as "hours/days". Level 0 is for analysis or postal chess, and presumably not recommended for beginners.

The program seems to be very strong, although it is difficult to tell without weeks of play. Audiogenic claim *Grand Master* beats all - or at least it beat other Commodore 64 chess programs.

Quite how much of the Commodore 64 quart Audiogenic has managed to fit into the C16 punt pot, is hard to guess.

No doubt there are C16 owners out there who will be delighted with *Grand Master*. I must admit, though, that it doesn't excite me - but then nor does the C16.

**Program** Grand Master

**Price** £8.85

**Micro** C16

**Supplier** Audiogenic  
PO Box 88  
Reading  
Berks

# This Week

Theatre Europe	■	Commodore 64	£9.95	Incentive
Eastdate	■	Einstein	£29.95	Tatung
Home Budget	Ut	Einstein	£19.95	Tatung
Keydefine	Ut	QL	£9.95	Parentile
Sketchpad	Ut	QL	£14.95	Sigma Research
Deathstar Interceptor	Arc	Spectrum	£7.95	System 3
Starion	Arc	Spectrum	£7.95	Melbourne House
Battle for Midway	S	Spectrum	£8.95	PSS
Confuzion	S	Spectrum	£6.95	Incentive

The Open	S	Spectrum	£4.00	Watsoft
Letaset	UT	Spectrum	£3.95	Eclipse
Microdrive Fastload	Ut	Spectrum	£4.95	Specialist
Microdrive Mate	■	Spectrum	£6.95	Quick Byte

**Key:** Ad - adventure, S - strategy-simulation  
Arc - arcade, Ut - Utility  
Ed - education.

Pick of  
the week

## INFAMY, INFAMY

Legend is the only company I can think of at the moment that manages to be both famous and infamous at the same time. I would describe the credibility history of the company roughly like this: *Valhalla*, two steps forward, *The Great Space Race*, two steps back. Now we have *Komplex* and I'm pleased to say it's at least 1½ steps forward again.

*Komplex* is not, in any significant way, an adventure – it looks vaguely like *3D Battlezone* but it's better than that. Call it an abstract arcade game that could last for a couple of hours in play.

It works like this: two thirds of the screen displays a three dimensional view of the decks and levels of an alien world. In this world are scattered letters of the title K,O,M,P,L,E,X. You must locate each letter and place it in the central control computer.

Moving from level to level

takes place via a tube which is protected by various devices. Other devices on each deck drain power from you.

You could say *Komplex* is a 3D collect and dodge type of game but that's to denigrate it. The strategy elements of the game are fairly sophisticated and you don't just blast and blast – there is no question of three lives here.

But the most impressive thing for me is the look of the game. The landscape where all this action takes place is genuinely strange and alien. What you see, as you move around this world (in excellent hi-res scrolling perspective), are rectangles in the middle of nowhere, curious spindly poles, sudden holes in the ground, dream-like floating geometrical aliens and the fact that it's all in black and white just adds to the faintly mathematical and disturbing effect.

*Komplex* is a truly imagination gripping game, something that cannot be said for many others. You'll need to map its world if you're going to stand any chance of locating the letters and finding your way through the service tubes to the CCC. It's mostly brains, not brawn, that's required.

**Program** *Komplex*  
**Price** £8.95  
**Micro** *Spectrum*  
**Supplier** *Legend*  
PO Box 435  
London  
E47 LX

## IMPROVED

There are any number of compilers available for the Spectrum but few for the Commodore 64. One of the cheapest I have seen is from a one-man-band software house run by J Marshall.

The compiler costs £12 and can handle both 8-bit and 16-bit unsigned expressions and includes an Assembler – it can accept assembly language mnemonics freely mixed.

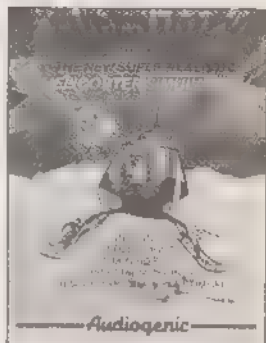
The manual is, inevitably perhaps, a home-made photocopied affair. While it's not actually badly-written, it could put you off and I'm positive through long and bitter experience with *Popular* that there will be bugs in some of the typewritten listings.

Like most compilers, there are problems with things like strings such that you can't use them. On the other hand, though, the commands for sounds and graphics are considerably improved.

**Program** *MS Basic Compiler*  
**Price** £12  
**Micro** *Commodore 64*  
**Supplier** *10 Hawkshead*  
Street  
Southport  
Merseyside

## PURE BLISS

There are now two ways of buying *Super Huey* the whizzo helicopter simulation epic in which you can just about do everything you could possibly do with a real helicopter. Not only that but using a series of data tapes held on a separate tape you



can choose different kinds of tasks – exploration, rescue, combat.

Two ways? You can either pay around £10 for the US Gold version licensed from the states or £8.95 for the Audiogenic licensed version. There is no difference whatsoever between the games – perhaps you will think the US Gold packaging is worth an extra quid or so.

Anyway the game features something like 28 separate controls on the instrument flight panel – you won't get into the game easily. On the other hand once you do start to master it you get an enormously wide range of different options such that you are unlikely to exhaust the possibilities of the game before your Commodore 64 crumbles into dust.

Not for everyone then, but for hardened simulation buffs, pure bliss.

**Program** *Super Huey*  
**Price** £8.95  
**Micro** *Commodore 64*  
**Supplier** *Audiogenic*  
PO Box 88  
Reading  
Berkshire

## This Week

**Addictive Games**, 7a Richmond Hill, Bournemouth BH2 6HE 0202 298404. **Audiogenic**, 39 Sutton Industrial Park, London Road, Reading, Berks 1A2 0734 664646. **Eclipse**, 79 Ardrossen Gardens, Worcester Park, Surrey KT4 7AX. 01-330 3116. **English**, Box 43, Manchester M60 3AD 061 835 1358. **Illusions**, Park Crescent, Peterborough PE1 4BG 0733 312120. **Imagine**, Imagine Software, 11 Central Street, Manchester M2 5NS. **Incentive**, 54 London Street, Reading RG1 4SQ 0734 591678. **Intrigue**, Cranbrook Road, Tenterden, Kent TN30 6UJ. 05805 4726. **James Paton**, 2 The Avenue, Fallings Park, Wolverhampton. 0902 725762. **Kuma**, Kuma Computers, 12 Horseshoe Park, Pangbourne RG8 7JW.

07357 4335. **Melbourne House**, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD. 0235 635001. **PSS**, 452 Stoney Stanton Road, Coventry CV6 5DG. 0203 667556. **Palentific**, 37 Coltesmore Road, Hestle, North Humberside HU13 9JQ. 0482 649187. **Quick Byte**, 20 Hastings Road, New Southgate, London W11 2RJ. **Sigma Research**, 231 Caldhams Lane, Cambridge CB1 3HV. **System 3**, 138 Carlton Avenue, East Wemby, Middlesex. **Talung**, Stafford Park 10, Telford, Shropshire TF3 3AB 0952 613111. **US Gold**, US Gold Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY 021 359 3020. **Watsoft**, 49 Abbotsview, Haddington, East Lothian





## Junk merchants

**B**urroughs is today one of the world's biggest computer giants - selling mainframes and mini's.

Beyond a particular 'critical size' a company's international approach seems to be reflected by a corporate attitude to everything - buildings, furniture, dress, hierarchy, relaxation and politics. Raise an issue - anything from Star Wars to the role of women - and there is an official answer. Invariably it is as bland as you can get while still just saying something. People who work for big companies go to Holiday Inns all over the world and find people just like them, who drive General Motors cars and wear Pierre Cardin ties and designer jumpers for the evening.

But the Burroughs Computer Corporation has another side. He is called William Burroughs and he has written books like *The Naked Lunch* and *The Ticket that Exploded*. The creator of the literary cut-up technique and a noted exponent of stream-of-consciousness writing, you may think that Burroughs is as far removed from computers as you can get. You would be wrong because Burroughs knows a lot about selling and, in particular, selling in the 'junk' world we live in today.

When computers first arrived in this country there was a massive amount of interest from the public. Computer manufacturers have caught on. The language of mass selling is seen as worthwhile in its own right. Thus Jack Tramiel can talk about "selling personal computers to the masses", and journalists are happy to hang on to his every word without thinking - "Yes, but what are those masses going to do with their computers?" In a

lot of cases, of course, they will simply gather dust in a cupboard somewhere.

William Burroughs says of such cant: "The junk merchant does not sell his product to the consumer, he sells the consumer to the product. He does not improve and simplify his merchandise. He degrades and simplifies his client."

How many times have you bought an applications program having been told that it would do  $x$ ,  $y$  and  $z$ , only to find that it does only  $x$  minus three and  $z$  divided by five? Do you then rush back and say "It's not good enough?" And if you, do how many times have you been told that everything is still OK because it's a great program for the price?

By the time the buyers have realised their mistake, another development will be on the market and they'll just be gnashing their teeth until they can afford to buy it. Computers are fast becoming a part of our junk culture like soap operas, hamburgers and food processors. All obey three simple laws:

- 1 Never give anything away for nothing.
- 2 Never give more than you have to give (always keep the buyers hungry and always make them wait).
- 3 Always let them know there's more where that came from. The "more" will always be faster, easier to digest, sexier, better, worth waiting for and so on.

Wittgenstein, in his *Tractatus Logico-Philosophicus*, says: "If a proposition is not necessary it is meaningless and approaching meaning zero." And Burroughs asks: "And what is more unnecessary than junk if you don't need it?" And the answer is "Junkies, if you are not on junk." The sort of 'junk' computers provide is information. People think - mistakenly - that information, of itself, will help them become wiser, more intelligent and better equipped to deal with the dynamics of life.

And so it goes. The build-up prior to the release of a computer - Atari's ST for example - has now reached hysteria point. After its release I predict a swift feeling of disappointment, before the search begins for the next 'amazing' micro just out of reach on the horizon.

**Michael Scialom**

## Split digits

**Puzzle No 153**

"This is a very interesting number," remarked Professor Hex to some of his students.

**98029801**

"You'll see, if we split this number into two four-digit numbers the number represented by the first four digits (9802) is just one more than that represented by the remaining four (8029). Also, the complete eight-digit number is a perfect square!"

"What I would like you to do," commented the Professor, "is to find another eight-digit number that has the same property."

Can you help his students to find what this number could be?

**Solution to Puzzle No. 148**

The pond will be completely covered on the 10th September.

```
10 LET PAD=1;LET DAY=1
20 LET PAD=PAD+(PAD*3/100)
30 PRINT DAY,PAD
40 IF PAD>2 THEN GOTO 80
50 LET PAD=PAD-(PAD*2/100)
60 LET DAY=DAY+1
70 GOTO 20
80 PRINT "DAYS ELAPSED=";DAY
90 END
```

The program works by assuming that the present area of the lily is equal to 1 unit, and by a repeated increase of 3% and decrease of 2%, counts the number of days which elapse until the area doubles to over 2 units.

This gives a result of 72 days, so, counting the first of July as day 1, we arrive at an answer of September 10th.

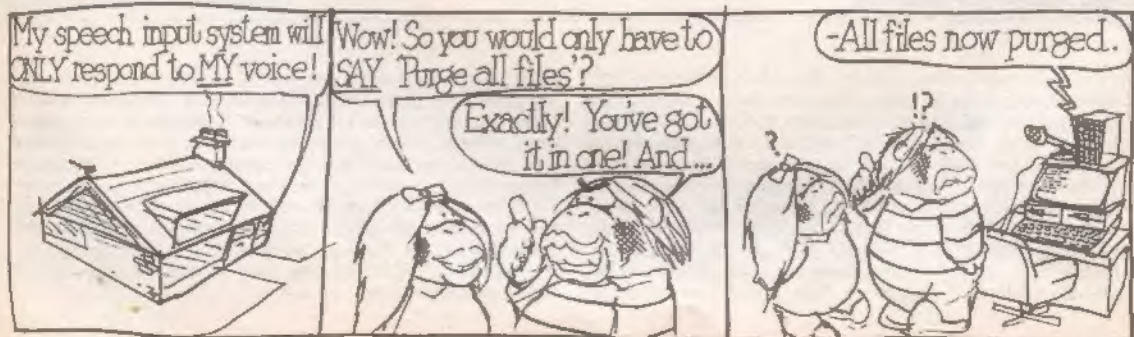
**Winner of Puzzle 148**

The winner is EC Oats of Douglas, Isle of Man, who receives £10.

**Rules:**

The closing date for Puzzle No 152 is May 6

## The Hackers





# Hi ... Rat Fans

# Roland's Rat Race



Yeh, it's me, your favourite Superstar, in my first-supa-game! I'll need all your help to find my furry friends in the nasty Rodent World where all kinds of monster meanies live. Hurry now, and I'll see you on your screen, from your cuddly, adorable me, Roland Rat, Superstar.

**\*NEW\***

SPECTRUM 48K  
**6.90**

**ocean**

COMMODORE 64  
**7.90**

Ocean House - 6 Central Street, Manchester M12 5NS Telephone 061 832 6633 Telex 669977

Ocean Software is available from selected branches of **WICKMORTH, WHISMITTLE, LASKYS, Rumbelows, COMET.**  
Spectrum Shops and all good software dealers. Trade enquiries welcome

*it's  
brill!*



# ADVERTISEMENT

ABOVE THE CLOUDS, THE CREW OF P.O. BOX 78 GET SET TO ADVERTISE FOR SOME NEW IDEAS FOR GAMES....

WE'VE GOT A WIZARD CROP OF NEW M/C ARCADE GAMES CHAPS, BUT WE STILL WANT ANOTHER ONE OR TWO...

THE LASERS ARE ALL SET UP FOR THE PMAN TO MAKE A HOLOGRAPHIC APPEAL TO THE WORLD BELOW!

SORRY. I'M NOT UP TO IT. I DUNNO WHAT IT IS. I DON'T FEEL WELL. I THINK THERE'S GOING TO BE A STORM.

YES, THERE IS A BIT OF STATIC IN THE AIR... ONE OF YOU GUYS FILL IN?

TAYNO GOOD, ANYHOWAN KEN ONNASHTAN ME LEENGO!

AN' I CAN'T DO IT. THEY'LL THINK THE BLEEN' MARTIANS 'AVE LANNID!

OH, I'LL DO IT. GIVE ME THE BIT OF PAPER!

HARUM. HELLO! HELLO, YOU FOLKS!

## LADY CLAIR SPEAKING!

... WE STILL NEED YOUR ORIGINAL M/C ARCADE GAMES! YOUR CHANCE TO GET FAMOUS\* AND MAKE US ALL SOME\* MONEY!!

NO MORE OF THAT STUFF FOR ME!

THEY MIGHT HAVE WARNED US!

JUDGEMENT DAY IS ALMOST HERE!!

HELLUP

ARMAGEDDON! CHAOS! DEUS EX SINGINE!

Gremlin EVANS

OK - WELL, MAYBE, ALTHOUGH IT DEPENDS WHAT YOU MEAN, 'FAMOUS'.

OK - PROBABLY LOT, BUT...

NEXT WEEK! A VERY NASTY SHOCK.....

THE SALE OF THE FORTNIGHT! THE SALE OF THE FORTNIGHT! THE SALE OF THE FORTNIGHT! YES FOLKS! This could be your last chance to buy at these CRAZY 'PI-THETIC SALES SALE!' PRICES! '10 PACK' Vol.1. 48k Spec. 10 GREAT games on 1 SOUPER DOOPER BUDGIE cassette! Including:-DARTZ, MORRIS MEETS THE BIKERS, PI-BALLED, PI-EYED, PIROMANIA, OLYMPIANIA, CRUSOE, YAKZEE, NEW WHEELS JOHN? & PI-IN'ERE. Normal shop price (if wholesalers handled it!) £10. But to you NOW ONLY £5

'Go to Jail' 48k Spec. This classic property trading game. Normally sells for £6 ONLY £3

The program voted by the Computer Trade (including Wholesalers!) 'PROGRAM OF THE YEAR' in 1985 'DEUS EX MACHINA' 48k Spec. \_\_\_-or- CBM64 \_\_\_ (cassette). Normal Price £15. NOW ONLY £5

OFFER ONLY WHILE STOCKS LAST. NO CREDIT CARD SALES. ORDERS MUST BE SENT ON THIS ORIGINAL COUPON

Name \_\_\_\_\_ Address \_\_\_\_\_

Post Code \_\_\_\_\_

Send CHEQUE/P.O. ONLY TO:- AUTOMATA U.K. Ltd, PO Box 78. SOUTHSEA. HAMPSHIRE. PO4 9SL. ENGLAND!

